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*J. Linnell . with the*

CONTRIBUTIONS

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TO THE

*H. Linnell*

*June 23*

PATHOLOGY AND PRACTICE

OF

SURGERY.

BY

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ETC. ETC. ETC.

EDINBURGH:

SUTHERLAND AND KNOX, PRINCES STREET.

SIMPKIN, MARSHALL, AND CO., LONDON.

MDCCCXLVIII.



MURRAY AND GIBB, PRINTERS, EDINBURGH.



## PREFACE.

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WHEN a famous oculist confessed that his skill had been acquired at the expense of destroying "a hatful of eyes," and a late no less distinguished surgeon declared, that experience in his department of the profession could be attained only by "wading through blood," it is to be feared that, although the language might be somewhat rough, the statements were founded on truth.

It is plainly the duty of every one engaged in a pursuit so arduous, to communicate all the observations in his power for the guidance of those who follow in the same path, or advance by others of a similar kind ; and possessing the unprecedented advantage, in Edinburgh, of a permanent appointment to the hospital practice of surgery, I have felt it peculiarly incumbent upon me to write for the information of my professional brethren. The papers contributed with this view, during the last twenty

years, have appeared in various periodical publications, in the volumes of which they are now nearly, if not quite beyond the reach of most readers. Having been frequently requested to publish them in a separate form, I now offer a selection of those that appear most worthy of being preserved, together with some additional remarks requisite for connecting and completing the observations which they contain.

To my old pupils, I trust that the recollections awakened by perusing the memorials of subjects in which we felt a common interest, will not be displeasing; and to other practitioners, I venture to hope it may be satisfactory to see fully stated, facts and principles which have perhaps reached them only through the imperfect and perverting channels of "Compendiums" or "Manuals"—the parents no less than the offspring of mediocrity.

I have not attempted any arrangement of the different Articles, either as to time or subject, and therefore must beg the reader to notice their respective dates, which will not only assist him to appreciate the substance, but also, I trust, induce him, in some degree, to excuse the defects of the earlier contributions.

EDINBURGH, 20th November 1847.



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# CONTRIBUTIONS.

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## ARTICLE I.

### ON THE SOLUTION OF CAOUTCHOUC.

HAVING from an early age taken much interest in chemical pursuits, I became impressed with the importance of obtaining a cheap solvent of Caoutchouc, from which that substance might be recovered without alteration of its characteristic properties. After many trials with this view, I at length completely succeeded, and was enabled to carry into effect several of the applications for which a fluid state of Indian rubber had seemed so desirable. Thus I constructed flexible tubes of the substance itself, and rendered various textures waterproof, by brushing a thin solution of it into their interstices. A silk cloak, which afforded complete protection from the heaviest rain, and could be employed as a pitcher by turning up its skirt, was an object of wonder to all who saw it. My friends talked of a patent, but being then about to commence the study of a profession, with which considerations of trade in those days did not seem to be consistent, I addressed the following letter to the editor of a scientific journal, resident in Glasgow.

(TO DR THOMSON.)

[FROM THE ANNALS OF PHILOSOPHY, AUGUST 1818.]

*Edinburgh, March 5, 1818.*

SIR,—I take the liberty of sending you an account of a valuable substance which may be obtained from coal tar.

If you think it worthy of being made public, you will oblige me by inserting it in your *Annals of Philosophy*.

I am, Sir, your most obedient servant,

J. SYME.

As coal tar in every respect bears the strongest resemblance to petroleum, it occurred to me, that by distilling it, a fluid might be procured, which, like naphtha, would have the property of dissolving caoutchouc, and that in this way I should procure a solvent free from the objections to which the known solvents of that remarkable substance are all more or less liable.

To ascertain this, I subjected a quantity of coal tar\* to distillation in a glass retort and receiver with a moderate heat. When the fluid which came over amounted in bulk to about one-third of the tar operated on, I put a stop to the process.

Upon examining the product, I found that it was not homogeneous, but consisted of two differently co-

\* At that time the only gas used in Edinburgh was to light a shop on the South Bridge.



loured fluids, quite distinct (as oil and water from each other when allowed to remain together without agitation), and which existed in nearly equal quantities.

Having separated these by means of a funnel, I examined the properties of each. The one supernatant was of a dark amber colour, and had a strong, peculiar, penetrating odour. A piece of paper soaked in it, when inflamed, burned with much flame and smoke. Acids acted on it as on naphtha, giving it the appearance of petroleum. The other fluid was colourless, uninflammable, had a strong ammoniacal odour, and effervesced with acids; in short, seemed to be some of the ammoniacal fluid, produced during the distillation of the coal, from which it is very difficult to free the tar entirely.

I redistilled the first-mentioned fluid, and obtained a light straw coloured oil, very inflammable, having a strong and peculiar smell, and extremely volatile. A little of it rubbed on the hand, evaporated almost instantly, leaving the part quite dry. Its specific gravity I found to be about  $\cdot 770$ ; thus showing all the properties of naphtha in a state of purity.

I next proceeded to try the effects of this naphtha on caoutchouc. For this purpose I selected that kind of it which is met with in the shops, of a white colour and in form of a cake. Some slips of this being put into a bottle and covered with the naphtha, soon began to swell, and in a few hours were in such a state, that upon being stirred they cohered together, and formed a homogeneous mass.

I found that this mass might be brought to any degree of fluidity by the addition of the naphtha.

When a little of this solution was exposed to the air, the naphtha speedily evaporated, leaving the caoutchouc, which in a short time resumed its original elasticity.

Therefore, I think that I may with confidence recommend this fluid as being free from all the disadvantages of the hitherto known solvents of that substance ; and I hope that it may be the means of extending its use to the many purposes for which it is so peculiarly well adapted.

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This letter, though transmitted in the beginning of March, did not appear in the journal, which was published monthly, until August ; and not long afterwards a patent for applying the solution to making waterproof cloth, was taken out by a manufacturer in Glasgow, Mr Mackintosh. It is needless to say how fully my anticipations as to the employment of caoutchouc, for an endless variety of purposes, have since been realised. For my own part, I gained little credit and no profit, except the confidence which results from successfully struggling with a difficulty—and encouragement in endeavouring to accomplish other objects of utility. If, therefore, any of the proposals for improving the practice of surgery, which are contained in the following pages should seem deserving of attention, I hope the reader will excuse the apparent irrelevancy of this contribution.

## ARTICLE II.

## ON THE TREATMENT OF GANGRENA SENILIS.

[FROM THE EDINBURGH MONTHLY JOURNAL OF MEDICAL SCIENCE, 1841.]

THIS “nasty, painful, lingering, and destructive disorder,” to use the words of Mr Pott, has been generally regarded as one of the opprobria of surgery, and the subject of palliative rather than remedial treatment. Under the system of management usually pursued, it certainly leads, with few exceptions, to a fatal termination. But there seems reason to hope that, by proceeding on a different principle of practice, the result may be rendered less unsatisfactory, and more creditable to the healing art.

“The whole plan of the chirurgic treatment of this disease,” says Mr Pott, “is founded on a general idea of warming, invigorating, stimulating, and resisting putrefaction.” And it is very remarkable, that while his essay on the subject attracted so much notice as to connect his name with this kind of mortification ever since the time he wrote, the practice generally employed still continues the same as he has described it, notwithstanding his statement, that “whatever heats, irritates, stimulates, or gives uneasiness, appears to me always to increase the disorder, and to add to the rapidity of its progress; and on the contrary, I have always found, that whatever tended merely to

calm, to appease, and to relax, at least retarded the mischief, if it did no more." He accordingly recommends a simple poultice as the best local application, and the free use of opium internally.

Although the local soothing plan advocated by Mr Pott alleviates the patient's sufferings, and delays the progress of the disease, it never, in any instance that has fallen within my observation, proved sufficient to arrest completely the morbid action. In order to attain this more important object, it is necessary to lower the tendency to excitement throughout the system, by enforcing a strictly vegetable diet, abstinence from every sort of stimulant, and the maintenance of perfect quiet in the horizontal posture. I am aware that the proposal of this starving plan may appear rather startling, and unsuitable for the old and debilitated persons who are chiefly subject to the complaint; and it sometimes requires considerable firmness to get the requisite measures carried into effect, when opposed by professional as well as vulgar prejudices. But the admitted hopelessness of the case, under ordinary treatment, should encourage the trial of other means, especially such as have stood the test of experience. Hospital practice does not frequently afford examples of this disease, to the production of which redundant nourishment, though not essential, seems powerfully predisposing; whence it is met with much more often in persons of easy circumstances than in poor people, who are able to obtain merely the necessaries of existence. The following instance occurred in the clinical course of last winter, and having been treated beyond the reach of any inter-



ference calculated to occasion uncertainty, will be more satisfactory to the reader than others observed in private. <sup>1</sup>

Helen Byres, a very thin and weak old woman, stating her age to be fifty-seven, but apparently much more advanced in years, was admitted into the hospital on the 28th of January. She complained of severe pain in her left foot, especially in the little and great toes. The instep was red, and somewhat swelled, and extremely tender to pressure. The little toe was quite black, and the great one of a dark-purplish colour. The former had become painful between two and three weeks before, in consequence, as was alleged, of exposure to cold, together with wearing a tight shoe. After eight days of continued and increasing pain, discoloration was first noticed; and it was only a few days previous to admission that she had been suddenly seized with violent pain in the ball of the great toe.

Circumstances prevented my attention from being directed to this case until the end of a week, during which period nourishing food, with wine, had been prescribed, in accordance with ordinary practice, and the extremely debilitated appearance of the patient. Under this treatment the pain, redness, and swelling of the foot had increased, while the dark discoloration of the toes had extended. Having ascertained the nature of the complaint, I did not hesitate to order a strictly farinaceous diet, water for drink, and a simple poultice for the foot. The symptoms then gradually abated, and the patient, instead of sinking under the united effect of disease and weakness as

she had previously threatened to do, acquired additional strength, and greatly improved in her appearance. In the beginning of March the little toe separated at its metatarsal joint, and about three months afterwards the great toe did the same. The sores healed kindly, and presented on each side of the foot a no less seemly cicatrix than if a skilful amputation had been performed. The starving plan was then abandoned; and the poor old woman, after subsisting on bread and water for upwards of four months, was allowed the usual diet of the hospital.

In illustration of the treatment which it is my present object to recommend, may be mentioned a case by no means rare in private practice. The patient is usually a man in easy circumstances, somewhat addicted to the pleasures of the table, and beyond sixty years of age. Without any warning he observes a small pimple on his leg. It opens, and leaves a small sore, which, instead of healing, becomes covered with a slough, generally of a black colour, but sometimes white. The surrounding skin now inflames to a small extent; pain gradually increases, and is felt most severely at night, so that sleep is disturbed or prevented. The system then becomes seriously deranged, and the local affection still increasing, there is no limit to the morbid process except death itself.

The tendency to mortification in this form of disease, just as in that so well described by Mr Pott, leads practitioners to the employment of invigorating measures. And I have uniformly observed, that whether the patient was stimulated by an additional allowance of food and wine, or was permitted merely

to continue his ordinary diet, the sloughing action prevailed in opposition to every sort of soothing application that could be tried locally. But when the starving plan was adopted, and the patient restricted to vegetable articles of support, the redness has quickly disappeared, the pain has gradually decreased, and the sloughs, ceasing to extend, have been detached from a subjacent healing surface of granulation, which before long formed a sound cicatrix. The only means employed on such occasions, in addition to the vegetable regimen, have been linseed poultices, and the muriate of morphia given freely, either solid or in solution, so long as the nocturnal pains continued. It may be added, that no inconvenience has ever been sustained, to my knowledge, either from adopting the spare system, or resuming the ordinary one, even when the age of the patient was beyond eighty years.

Professional opinion is still unsettled as to the cause of mortification in the extremities of old people. Ossification and obstruction of the arteries are frequently met with on dissection, but not always; while, on the other hand, the former of these conditions is infinitely more common than the effect in question. All we know with certainty seems to be, —*first*, that there is a combination of weakness and over-action in the affected part; *second*, that the weakness cannot be remedied either by local applications or internal remedies; *third*, that the means employed with this view powerfully excite the tendency to over-action; and *fourth*, that the best mode of treatment consists in the employment of soothing measures, local as well as general, until the part regains

its usual condition—just as when a portion of the body has been weakened by exposure to cold, or by the ligature of its principal artery.

---

The opportunities of further observation presented to me since the paper, here reprinted, was published, have tended to confirm the views it communicated to the profession. Difficulty has occasionally been experienced in overcoming the prejudices of practitioners, as well as patients and their friends, sufficiently for a fair trial of the system proposed. But the advantage almost immediately derived from abandoning the use of nutritive food, with its stimulating accompaniments of wine and spirits, is so obvious, that this plan of treatment has required only a commencement to insure its continuance. Attention to the subject has now been fully awakened, with the effect of generally introducing a salutary change in the management of Gangrena Senilis, although it appears that the highest surgical authority in the southern metropolis, is still in favour of nourishment and stimulation.

“ In the management of these cases (*Gangrena Senilis*) there can be no doubt that one principal object to be kept in view is the maintenance of a sufficient supply of blood in the system. As the abstraction of blood is mischievous, so the opposite treatment is likely to be beneficial. Let the patient, then, be put on a system of nutritious diet, not overloading his stomach, so as to produce a red and yellow sediment in the urine, but taking as much food as can be easily



assimilated, and no more. Let him live chiefly, but not entirely, on animal food, which makes blood—if I may use the expression—of a better or stronger quality than that derived from vegetables alone. In addition to this administer some such stimulants as ale, wine, or brandy. You will generally find that persons who have mortification of the toes have been accustomed to take a good deal of fermented or spirituous liquor, and, being accustomed to it, that they cannot do without it. Nor is this all. Those whose mode of life has been different will require the exhibition of stimulants under these new circumstances. The question, however, will arise in each individual case, What is the proper quantity to be exhibited? Some persons may want a bottle of one of the stronger wines daily; but very few, on this, or on other occasions, are benefited by so large an allowance as this. In the majority of cases, from the third of a pint to a pint daily will be sufficient. You should ascertain what have been your patient's previous habits, and then give him stimulants cautiously, observing the effect produced. There is one good rule of conduct in this respect, both in health and in disease; any quantity of wine that does not occasion heat of skin, nor raise the pulse, nor make the mouth clammy, nor render the patient nervous or irritable, may be given with advantage; but whatever does more than this does mischief.”\*

The plan I advocate must not be confounded with that, chiefly supported by the French pathologists,

\* Sir Benjamin Brodie. Lectures, 1846, p. 367.

which consists in treating the disease as of an inflammatory nature by scarification, leeching, venesection, and other measures, that belong to the antiphlogistic system. This differs no less from the method which it is my object to recommend, than from the treatment by stimulation,—since, if the limb concerned, be suffering from *weakness*, combined with a tendency to *over-action*, it seems not more improper to cause or increase excitement by the administration of stimulants, than it would be to reduce the strength which exists, by general or local depletion. Regarding the morbid derangement as essentially depending upon a combination of the conditions just mentioned, I should consider both these modes of treatment as equally objectionable, and in their stead would simply endeavour to protect the part affected from excitement, as well as depression, until the over-acting disposition can be allayed. The former of these objects, I believe, may be best attained by enveloping the part with a poultice, or a thick covering of cotton or wool; and the latter by placing the patient in the horizontal position, with injunctions to maintain a strictly farinaceous and milk diet. The solution of muriate of morphia should also be given in doses of 30 drops from two to four times a-day, or more freely, if this should be found necessary for the relief of pain. But in the absence of pain, a moderate quantity of this soothing agent should still be prescribed, as it unquestionably excites a powerful and most beneficial influence in restoring the healthy action.

## ARTICLE III.

## EXCISION OF THE LOWER JAW.

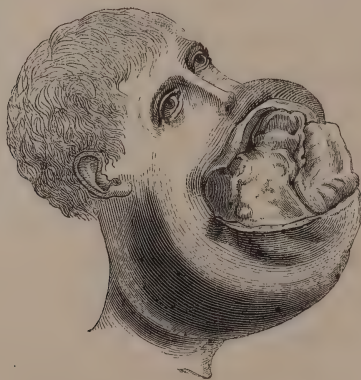
[FROM THE EDINBURGH MEDICAL AND SURGICAL JOURNAL, NO. 97, 1828.]

THOUGH excision of the lower jaw has of late years been frequently performed by various surgeons at home and abroad, I venture to hope that the following case will be read with interest, since the tumour which was the subject of it is, I have reason to believe, the largest that has been removed by this operation.

Between eight and nine years ago, Robert Penman from Coldstream, then sixteen years old, noticed a hard swelling of the gum on the outer side of the grinding teeth of the lower jaw. The swelling was not painful, but gradually increased. When it attained the size of an egg, he applied to a surgeon of the neighbourhood who extracted three of the adjoining teeth. It then grew more rapidly, and having at length become so large as an orange, induced him to repair to the Royal Infirmary of this city, where it was removed, *i. e.* cut off from the bone. The wound did not heal, and the actual cautery was repeatedly applied in vain to make it do so. After remaining eight months in the Infirmary, he returned home; but find-

ing the tumour regularly and rapidly increasing, he, two years afterwards, came again to Edinburgh, and consulted a distinguished operating surgeon (now in London), who declined making any attempt towards his relief. He went home with the fearful prospect of a certain, lingering, and painful dissolution; and it was after *three years and a-half* spent in this miserable state that Dr Sibbald of this city happened to see him. Though the tumour was then nearly three times larger than it was when the patient last quitted Edinburgh, Dr Sibbald felt persuaded that it was still within the reach of surgery, and therefore encouraged the young man to come once more to town, which he accordingly did.

Though prepared for something very extraordinary and frightful, I certainly was astonished at first sight of the patient.



This representation may give some notion of what mere words are altogether inadequate to express.



The mouth was placed diagonally across the face, and had suffered such a monstrous distension as to measure fifteen inches in circumference. The throat of the patient was almost obliterated in appearance, there being only about two inches of it visible above the sternum, so that the cricoid cartilage of the larynx was on a level with that bone. When the tumour was viewed in profile it extended eight inches from the front of the neck.



It completely filled the mouth, and occupied all the space below it, from jaw to jaw. The tongue was thrust out of its place, and lay between the teeth and cheek of the right side. The only portion of the jaw not implicated in the disease was the right ramus and base of the same side, from the bicuspid teeth backwards. The tumour, where covered by the integuments, was uniformly very firm, and for the most part distinctly osseous. The part which appeared through the mouth was a florid, irre-

gular, fungous-looking mass of firm consistence, from which an alarming hemorrhage had occasionally occurred ; and for the last three or four weeks there had been almost daily a discharge of blood to the extent of one or two ounces. Notwithstanding the great bulk of the tumour, the patient could move his jaw pretty freely in all directions. With the exception of the disease now described, Penman enjoyed good health. He was a tall, well made, though much emaciated, intelligent young man, and possessed uncommon fortitude.

Having carefully examined the tumour, I undertook to remove it ; and this proposal meeting with the approbation of Dr Abercrombie and Professor Ballingall, was, with the assistance of the latter gentleman, carried into execution on the 7th of July, in the presence of Dr Abercrombie, Professor Russell, Dr Hunter, &c.

The patient being seated on a chair, which posture I preferred, as being most conducive to the prevention of suffocation from hemorrhage during the operation, I made an oblique incision by running a sharp pointed knife through the lip, from the right angle of the mouth to the base of the jaw, where I proposed to divide it, viz. at the second bicuspid tooth, which had been previously removed. Having exposed the external surface of the bone at this part, I divided it partially with a saw, and easily completed what remained by means of the cutting pliers. The inferior coronary artery, which Dr Ballingall had prevented from bleeding by compressing it in the lip, was then tied.

I next made a long semicircular incision from the left angle of the mouth, in the direction of the base and ramus of the jaw, and terminating over the condyle. Having secured the facial artery, and two transverse branches of the temporal, I dissected down the large flap thus formed quite to the neck, so as to let Dr Ballingall feel the carotid lying in the muscular interspace, and ready to be compressed if there should be occasion. I then made another curved incision in a similar direction, commencing from the mouth, at such distance above the former as to include a portion of the cheek, which was firmly adherent to the tumour; and, having dissected up this flap, divided the masseter muscle, so as to expose the whole external surface of the tumour. The next step was to divide the mucous membrane of the mouth. This rendered the tumour much more moveable, and enabled me to expose the coronoid process, divide the temporal muscle, and open the articulation at its fore part. I had then merely to cut closely round the condyle, and detach the pterygoid, mylohyoid, and other muscular connexions.

The operation occupied twenty-four minutes; but all this time was not employed in cutting, as I frequently allowed a little respite, to prevent exhaustion from continued suffering. The patient bore it well, and did not lose more than seven or eight ounces of blood. His breathing was never in the slightest degree affected.

After placing a few folds of lint in the great cavity left by the tumour, which weighed  $4\frac{1}{2}$  lbs., I brought the integuments together on the left side of the face,

in a triangular form, and retained the edges in contact by the twisted suture. The incision on the right side was dressed in the same way. Two or three turns of a roller were then put round the chin and head, so as to support the relaxed integuments.

The patient made no complaint of any sort after the operation. His pulse for the first two days was about 100, but soft, and gradually subsided to the natural standard. He slept well; had an appetite for his food, viz., beef-tea and whey, which were introduced into the pharynx through a funnel with curved tube; and performed his excretions regularly. The whole of the lint was removed by the third day, when the patient sat up, and declared that he felt better than he did previous to the operation.

In concluding this case, I may offer a few general remarks on the mode of operating.

The patient ought certainly to be seated, since the blood will thus be prevented from running into his throat so as to delay the operation, or even render tracheotomy necessary to prevent suffocation.

There is no advantage in tying the carotid artery previous to commencing the extirpation. I was advised to do so in this case, but declined on the following grounds:—1. It is unnecessary, since the only arteries which must and ought to be cut are the facial, some of its branches, and some branches of the temporal. 2. It must exhaust the patient, especially when the tumour throws an obstacle in the way, as in Penman's case, where there was hardly any space left for applying a ligature. Thus, in one of Dr Mott's cases, the patient was so much fatigued as to



require the delay of a day after the artery was tied. 3. It increases the danger, since it cannot be denied that there is always more or less risk of hemorrhage on the separation of a ligature from so large a vessel as the carotid. 4. It is of no use, since the anastomotic communications are so free, that a ligature of the trunk is not sufficient to arrest the flow of blood from its branches. Thus, in Dr Mott's case above mentioned, the arteries which were cut during the operation required to be tied; and I have heard of a case where the operator, attempting to remove a tumour of the upper jaw, tied *both* carotids, and was still obliged to desist by the bleeding. 5. Any good effect that can be expected from *tying* the trunk, may be obtained by *compressing* it after the integuments lying over it have been dissected off or divided.

The external surface of the tumour should be completely exposed before proceeding further, since all the vessels which ought to be tied may then be secured in the first instance, and a free drain is afforded to the blood which oozes from the small branches. The mucous membrane of the mouth being next cut, the tumour is rendered much more moveable, and the surgeon will generally be able to free the coronoid process from its muscular connexions. Should he fail in doing so, he ought to cut it across with the saw or pliers, and then, depressing the tumour as far as possible, open the articulation on its fore part; after which he has merely to carry his knife close to the tumour, and divide the remaining attachments.

I think Dr Cusack is entitled to much praise for insisting on the propriety of opening the articulation

from before, since a wound of the internal maxillary, or even the temporal, is otherwise almost inevitable. Thus Mr Liston, in the case detailed in the last number of this Journal, opened the joint from behind, and found it necessary to tie the common trunk of the temporal and internal maxillary,—in short, the external carotid. And I think that the patient in this case would hardly have suffered the severe secondary hemorrhage which is mentioned in the relation referred to, if the superficial vessels merely had been divided.

It appears, also, that in Mr Liston's case the ascending branches of the portio dura were cut, since the patient's eyelids were paralysed. Now, this in all probability would not have happened if the articulation had been opened from before.

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About two years ago, and consequently seventeen years after this operation, I was stopped in the street by a well-dressed, respectable-looking man, who introduced himself as "Penman." He told me that, after working for several years at home as a boot-maker, he had gone in quest of better wages to New York; that he had spent ten years in America, whence he had just arrived; and that he proposed to return there after a short visit to his native country. I was no less surprised than pleased to see how little the operation had injured either his appearance or articulation. Careful inspection, indeed, was requisite to enable an ordinary observer to detect any thing peculiar in either of these respects.

Since the date of Penman's case, I have operated many times, in a great variety of circumstances, for the removal of tumours originating in the lower jaw, nearly always with the effect of affording permanent relief to the patient. Of the very few cases that terminated unfavourably, two were those, in one of which the operation was most extensive, and in the other most limited. In the former I disarticulated the entire jaw, expanded into an enormous growth, by making an incision from ear to ear under the chin, without cutting through the lip. The operation was performed in the Royal Infirmary on the 1st November 1843, with little more difficulty than usually attends the removal of one *ramus*, and the patient, a female, twenty-five years of age, bore it so well, that the most favourable expectations were entertained of her recovery. Every thing went on well until the evening of the following day, when her respiration suddenly became embarrassed, and she died before the cause of disturbance could be either discovered or remedied. I had some suspicion that displacement of the tongue was concerned in producing the effect, but could not obtain any satisfactory information upon the subject. Of the other case I have given the following account :\*

DISARTICULATION OF THE RAMUS OF THE LOWER JAW,  
WITHOUT OPENING THE CAVITY OF THE MOUTH.

ABOUT the middle of July, in passing through Dumfries, I was asked by Dr Blacklock to see a lady who

\* Monthly Journal of Medical Science, 1843.

was suffering from a tumour of the face. She was between thirty and forty years of age, and had enjoyed good health until the preceding summer (1842), when her friends remarked that she had become thinner than before; and she noticed some uneasy feeling in the left side of her face. The jaw was impeded in its movements, twinges occasionally extended from the ear to the temple, and she experienced pain from resting her head on the affected cheek. In the month of December, as these symptoms had not diminished, but rather increased, and become associated with a hard swelling in the situation of the parotid, the advice of a medical friend was requested in regard to her complaint, and the gland being naturally looked upon as the seat of it, leeches, followed by blisters, were repeatedly applied without producing any good effect. The pain, stiffness, and swelling had continued to increase with accelerating rapidity, so as at length to excite the apprehension of there being a growth from the bone.

On examination, I found that the swelling occupied the situation of that part of the parotid gland which lies over the ramus of the jaw. It presented a slight convexity or circular form, about an inch and a half in width, extending from the zygomatic arch downwards, and backwards to the mastoid process. The consistence was so firm, that it could not be distinguished from that of bone. The jaw could not be expanded, so as to separate the edges of the teeth, and when moved to the slight degree still permitted, seemed to carry the swelling with it. On putting my finger within the cheek, I felt that the



tumour encroached considerably on the cavity of the mouth, but did not extend farther forwards than the wisdom tooth. From the observations which have now been stated, together with the history of the case, concluding that the tumour in no respect, except the peculiarity of its seat, differed from those that of late years have so frequently been removed with success, by excision of the lower jaw, I advised the operation to be performed without delay; and, a few days afterwards, the patient arrived in town for the purpose of undergoing it.

On the 25th of July, assisted by Mr Goodsir, I made an incision from the zygomatic arch down along the posterior margin of the ramus, slightly curved, with its convexity towards the ear, to a little way beyond the base of the jaw. Having then dissected the parotid gland and masseter muscle off the surface of the jaw, I divided it immediately behind the wisdom tooth, by means of cutting pliers, after notching it with a saw. As the ramus, upon this being done, did not as usual become more moveable, I searched for the reason of its fixture, and found that the tumour had extended inwards and backwards, so as to rest upon the pterygoid and styloid processes, and completely lock the bone into its place. Having contemplated difficulty from this source, though not to the same extent, I had provided a strong pair of tooth forceps, with which the ramus was seized at its divided extremity, and forcibly drawn outwards, while I divided its muscular connexions, as they were successively brought within reach of the knife. In this way the tumour was detached, and turned out quite entire.



It possessed the ordinary texture of fibro-cartilaginous growths proceeding from bone.

The operation was thus completed with wonderfully little disturbance of the face; there being no division of the facial artery, only partial detachment of the masseter and internal pterygoid muscles, and no wound of the mucous membrane of the mouth. There was, consequently, none of the distress which, in the first instance, necessarily results from dividing the whole thickness of the cheek, such as discharge of blood and saliva, inability of speaking, and difficulty of deglutition. The jaw, which had been previously locked, was at once set free, and the patient not only spoke with perfect ease, but swallowed her food as if the jaw had not been concerned in the operation. She also experienced none of the secondary inconvenience which is apt to ensue from lateral displacement of the jaw, through inequality of the muscles acting upon it. There was no constitutional derangement, and the wound healed almost entirely by the first intention.

I am not acquainted with any other instance of the ramus of the jaw being disarticulated without opening the cavity of the mouth; and though the circumstances admitting of this operation must doubtless be very rare, I think it right to place the case that has been related on record, as evidence, that when a maxillary tumour is limited to the ramus, it may be removed on easier terms for the patient than have hitherto been deemed practicable.

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Nothing could be more satisfactory than the condition and prospect of this case for some time after recovery from the operation. I regret to say, however, that, not many months subsequently, the glandular system became affected, and gave rise to a large swelling, which involved the bones of the face, and at length proved fatal.

The following case is deserving of mention on account of the great length of time during which the patient laboured under a tendency to the disease, and the effect of repeated operations in ultimately relieving him from it.\*

In the second volume of Mr John Bell's *Principles of Surgery*, p. 180, a case is related of which some extracts will be sufficient to give an idea of its most important features.

"A young gentleman, Mr H——, about twenty-five years of age, of an athletic form and healthy constitution, and without the slightest taint of disease, hereditary or acquired, had, from no perceptible cause, a tumour, firm, cartilaginous, and elastic, seated so fairly in the centre of the gums, as to raise the two centre teeth of the lower jaw from their sockets far above the general range of the teeth, and separate the two that lay adjacent."—"The tumour was about the size of a walnut, irregularly globular, knobby, and shining."—"A tyro must have believed it to contain a fluid."—"I was well aware that not a drop of fluid would follow a puncture, that the tumour inflaming, would turn

\* *Edinburgh Medical and Surgical Journal*, 1831.

out its edges, spread into a fungus, and in a few months cause a horrible and melancholy death.”—“Dr Monro, Mr Allan, and myself, having consulted on the nature of this tumour, declared it to be of a most dangerous nature.”—“We explained to our patient that it contained no fluid,—was incapable of suppuration,—was sure to become cancerous,—admitted of no delay,—and that we dared not do less than extirpate it from the very root.” Mr Bell describes the operation, and represents by drawings the appearance of the tumour, both before and after the operation. He used “a scalpel of special strength.”—“All my strength of hand was requisite to carry the knife down to the angle.”—“I cut with such decision, with such level lines, and made them so fairly meet with each other in the angle, that by pressing my two thumbs, one within side of the tumour, the other without, I pushed it out clear and unmangled.”

“This gentleman is perfectly cured; the gums and adjacent teeth firm and sound; and I confess I could not reflect on the structure of this small tumour without saying within myself, What would have been the state of this tumour in three months? What would have been his state in six or eight? In its second stage, in little more than three months it must have filled the mouth with a fetid bleeding fungus! In eight or ten months it must have assumed the perfect character of incurable loathsome cancer!”

It is evident that Mr Bell did not make the distinction that seems to be required between the medullary sarcomatous and cartilaginous growth of bone. If this tumour had been of the former kind the

result of his operation would not have been so satisfactory, and he would probably have had to encounter the fungous excrescences he so impressively describes. As it was, the morbid disposition still remained, and, after lying long latent, at last showed proof of its existence. About twelve months ago, that is, twenty-two years after Mr Bell's operation, this gentleman applied to me on account of a tumour, which so precisely resembled the one described by Mr Bell in size, situation, appearance, and consistence, that the engraving in his work would have answered equally well for representing it, with the exception of the two front incisors being absent. He stated that the swelling had commenced some months previously, and was increasing. He had little or no pain, but a sort of uneasiness about the mouth, and numbness of the lip.

In consultation with Dr Shortt and Mr Nasmyth, it was resolved to cut out the tumour again, and this was accordingly done. It then appeared that the morbid formation descended into the interstices of the bone, and when, by means of the cutting-pliers and gouge, nearly the whole thickness of the jaw at the part concerned had been removed, the exposed surface still showed cells filled with the same unhealthy substance. It was now evidently the most prudent course to saw through the bone on each side of the affected portion. But this proceeding was much more severe than the patient or his friends contemplated; and as the former operation, though not radical, had afforded so long an interval of freedom from visible disease, it did not seem warrantable, and

therefore the actual cautery was applied very freely in its stead.

The wound healed kindly, and the cure seemed to be complete. At the end of two months, however, the patient observed that there was more than usual fulness under the tongue, and it soon afterwards became obvious that the tumour was growing again along the whole extent of the jaw concerned in the former operation. The propriety of removing the affected part of the jaw was now strongly represented to the patient. He then consulted a person, who, for several weeks, made him believe that the external application of ointments would remove the swelling. Being at length awakened from this delusion by the decided opinions of Drs Ross, Shortt, and Hunter, Sir George Ballingall, Mr Nasmyth, and myself, he submitted to the operation, which was performed in the usual way. The jaw was divided on the right side, opposite the second bicuspid tooth, and on the left, immediately anterior to the last grinder; but as it appeared that, though the external part of the bone was sound here, a process of the cartilaginous growth extended into its centre, another portion was taken away, so that nothing but the ramus was left on this side. The wound healed every where by the first intention—on the ninth day the patient shaved himself, and he has remained since perfectly well. Five months have now elapsed, and he seems to be safe from any relapse. He speaks with perfect distinctness, and is so little altered in appearance that no one would suspect any thing unusual in the state of the mouth.



Had this tumour been left to itself, it would not probably have led to the frightful consequences anticipated by Mr Bell, but rather have gone on increasing in size, like the similar growth which was removed from the young man Penman, after repeated ineffectual attempts had been made to excise it, and being ultimately allowed to grow until it weighed four pounds and a-half.

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In 1836 this gentleman applied to me for the removal of a tumour in his cheek, near the chin, on same side from which the bone had been taken; and in 1837 he again came under my care for a rather formidable-looking fungous growth, the size of a small walnut, under his tongue. This tumour also was dissected out. He then enjoyed good health, and died last summer (1847) without having had any return of the disease.

## ARTICLE IV.

ON THE POWER OF THE PERIOSTEUM TO FORM NEW  
BONE.

[FROM THE TRANSACTIONS OF THE ROYAL SOCIETY OF EDINBURGH.  
VOL. XIV.]

*(Read 6th March 1837.)*

THE object of the following paper is to put at rest a question which has been long agitated in Surgical Pathology, and which is intimately connected with some important points of Practical Surgery. An apology may seem due to the Society for bringing under its consideration a subject, which, though not exclusively professional, is still little studied except by those physiologists whose views are directed to surgery ; but as the inquiry into which I propose to enter is neither long nor tedious, while it is quite intelligible without any previous knowledge of its details, I trust the patience of the members will not be exhausted ; and if the question shall, as I hope, be decided to the conviction of those members who are conversant with surgical discussions, the prevailing

diversity of sentiment relative to the point at issue will be more effectually composed than if I attempted to combat it through any other channel.

The question which I propose to consider is, “Whether the Periosteum, or membrane that covers the surface of the bones, possesses the power of forming new osseous substance independently of any assistance from the bone itself?”

This property was first attributed to the periosteum by Duhamel, just 100 years ago. Having been engaged in the study of vegetable physiology, and more particularly the formation of wood, he imagined that there might be an analogy between the inner layer of the bark and the periosteum, and that, as the former hardens in successive layers so as to constitute the wood, the latter might suffer a corresponding conversion into bone. He supported this opinion by the following arguments: 1. That when bones are burned in the fire or exposed to the weather, they separate into a number of thin plates. 2. That in consequence of disease arising from external violence, the bones frequently throw off thin scales, or exfoliations as they are called. 3. That when animals are fed alternately with madder and without it, their bones exhibit alternate layers of a red and white colour; and, 4. That when bones are fractured, they unite by means of an osseous capsule formed externally to, and embracing the broken extremities, just as the branch of a tree acquires strength after being grafted, or simply broken across.

This theory of Duhamel was strenuously opposed by Haller, who urged, as altogether inconsistent

with it, the mode in which bones are originally formed. He carefully investigated the process of ossification during incubation, and detailed the steps of its progress in the chick as well as other young animals. The rudiment of the future bone, being traced from its earliest distinguishable appearance, was found first to present the characters of a jelly ; then to acquire the consistence of cartilage or gristle ; and finally to reach the perfect osseous state : whence it was contended, that a structure which thus originated in a distinct form, and independently of any other, could not owe its increase afterwards to a different source. Haller also engaged his pupils Detlef and Boehmer in an extensive series of experiments, by breaking the bones of animals, and feeding them with madder during their recovery ; from the results of which he inferred, that Duhamel has been mistaken in supposing that fractures are reunited by ossification of the periosteum.

Notwithstanding these objections, and the authority of the physiologist from whom they proceeded, the doctrine of Duhamel still maintained its ground ; and not long afterwards, viz. in the year 1780, derived a great accession of strength from the experiments of Troja, who, by destroying the marrow of bones, caused their death, and the formation of new shells surrounding them, apparently from ossification of the periosteum. This experiment, which Troja himself performed some hundreds of times, when repeated and varied by the pathologists of almost every country, seemed to confirm the ossific power attributed to the periosteum beyond question, until Scarpa, the late

distinguished Professor of Pavia, again investigated the grounds on which it was originally founded by Duhamel. In Scarpa's treatise, "*De Penitiori Ossium Structura*," which was published in 1799, he explained, that the foliated appearance presented by bones that had been burnt, did not depend upon the development of a structure naturally belonging to them, but was an effect produced by the unequal action of the fire; and that the separation of scales from diseased bones was no stronger proof of their possessing a laminated structure, since thin and broad portions of dead substance are wont to be detached from the skin and other soft textures, in which it was never supposed that layers existed naturally. He recalled attention to the synthetic experiments of Haller, who, by investigating the formation of bone from the earliest stage to its perfect state, had established the reticulated nature of its texture; and by an opposite process of the analytic kind, which consisted in depriving bones of their earthy constituent by means of diluted acids, and then macerating them for a long while in water, he unravelled the texture so as to show that it really was reticular. As a consequence of these observations, Scarpa denied that bone could be formed by the periosteum; and this opinion was keenly embraced by several pathologists of the present century, and particularly by the French surgeon Leveillé.

At present, professional opinion is divided in regard to the ossific power of the periosteum, and different sides of the question are maintained by teachers and writers in this as well as other schools of medicine.



As the point in dispute is not merely a matter of curiosity, but one of great practical importance, it is very desirable that the truth should be ascertained. It would detain the Society too long were I to show how the different opinions on this subject may influence the practice of surgery ; and I shall, therefore, proceed to state the considerations which have completely satisfied my own mind, and are, I think, sufficient to satisfy any one who is open to conviction, that though Duhamel was misled into many errors by the false analogy which he supposed to exist between wood and bone—in regard to the mode of formation—the periosteum nevertheless does possess the power of producing new osseous substance, in certain conditions of disease.

The well-known and often-repeated experiment of Troja, which consisted in perforating the cavity and destroying the marrow of a bone, so as to kill it, and cause the formation of a substitute in the form of a shell surrounding the old one, was devised in imitation of a process which not unfrequently occurs spontaneously in the human body. In this disease, which has been named Necrosis, a portion of the old bone dies, and becomes surrounded by a new one. There is an example of this on the table, in which the tibia, or principal bone of the leg, has been thus affected. The new shell is of a larger size and more irregular form than the old one, which may be seen through a number of circular apertures lying a prisoner within this structure, intended by nature to serve as a substitute for it. Those who deny the ossific power of the periosteum, maintain that in all such cases,

whether resulting from injury purposely inflicted with the view of experiment, or proceeding from diseased action, a portion of the old bone remains alive, and serves as the germ of a new one; that, in short, the formation of a new bone is simply an expansion or growth from the remnant of the old one; and that, if merely the extremities of the bone affected remain alive, they will prove sufficient for generating the substitute shell.

It is difficult to reconcile this explanation with the rapid growth and uniform thickness of the new bone; since, if its formation proceeded from the extremities, the process should be slow and progressive towards the centre; but there is another objection still more conclusive against it. If the new bone is formed by a portion of the old one that remains alive, then the removal of a part by mechanical means should be supplied from the same source. But in all the cases where this has been done, either in the way of experiment or for the cure of disease, the loss of substance, unless of small extent, has been found imperfectly repaired. For instance, after the operation of trepanning the skull, the aperture in the bone, though it becomes diminished in extent, is not altogether obliterated, and the newly-formed bone is not only smaller than the portion removed, but also thinner, as may be seen from the specimens now produced.

In the fore-legs of dogs and rabbits, there are two bones of nearly equal size, and so connected, that a large portion of one may be taken away without destroying the rigidity of the limb. There is here, therefore, a convenient opportunity of trying what

can be done by the extremities of a bone for restoring losses of substance in its shaft. Experiments of this kind have accordingly been frequently performed on these animals, and the result has uniformly been, that when the portion removed exceeded an inch in length, there was a permanent deficiency of osseous substance, the ends of the bone being merely produced towards each other in a conical form, and connected together by a tough ligamentous texture. Sir A. Cooper has given representations of the results he met with ; and on the table there is a specimen of my own experience. (See Fig. I. p. 38.)

Some of those pathologists who deny the ossific power of the periosteum, and claim the whole production of new osseous substance for the bone itself, have attempted to explain away the difficulties which have just been stated, by supposing, that in cases of necrosis where a new bone is formed, the old one, in consequence of the increased action preceding its death, may determine the effusion of organizable matter into the surrounding soft textures, which will serve as a matrix or foundation for the new shell, and be ready to take up the ossifying process so soon as it is communicated from the surviving extremities of the bone. That the process of reproduction may be accomplished in this way I am not prepared to deny, but that it is not necessarily, or always so performed, will, I think, appear from the following case :—

A girl twelve years of age strained her ankle in the month of March 1835. Inflammation followed, extending up to the knee, and attended with violent fever. She was brought to the hospital, and placed

under my care. Incisions were soon afterwards made to evacuate a large collection of matter which had formed in the leg. And the bone being found dead, while the patient's strength was rapidly giving way, I amputated the limb above the knee, five weeks after the injury had been received. The girl recovered, and is now well. In examining the limb to ascertain the extent to which the bone had died, I found that it was partially surrounded by the commencement of a new one. This shell had already acquired considerable firmness at some parts, but was not equally thick throughout, and did not seem fixed to the ends of the old shaft. This observation led to a very careful dissection of the parts concerned; and they are now before the Society. It will be seen that the tibia had died very nearly from end to end, and that the new shell inclosing it has been formed in the periosteum. The new osseous substance may be observed at some parts in the form of small distinct scales. At other parts it looks as if it had originally consisted of separate portions, and been composed by their union. The periosteum connecting these portions to each other and the extremities of the bone, was not thickened beyond its natural condition; and where it covered the posterior surface of the tibia, though quite detached from the old bone, had not suffered any further change.

There is here, then, an instance of a bone dying suddenly in consequence of acute inflammation, without any thickening having previously formed in its neighbourhood, and nevertheless succeeded by the production of a new osseous shell, which evidently



could not proceed from the old bone, and no less evidently depended upon an ossific process resident in the periosteum.

As Nature is not capricious or variable in her proceedings, I regard this case as sufficient of itself, without any further evidence, to establish the ossific power of the periosteum. But, with the view of making the matter still more clear, I performed the following experiments:—I exposed the radius of a dog, and removed an inch and three-quarters of it together with the periosteum. At the same time I exposed the radius of the other leg, and removed a corresponding portion *without* the periosteum, which was carefully detached from it and left quite entire, except where slit open in front. Six weeks afterwards the dog was killed, and the bones examined. In the one from which a portion had been taken together with the periosteum, the extremities

Fig. I.

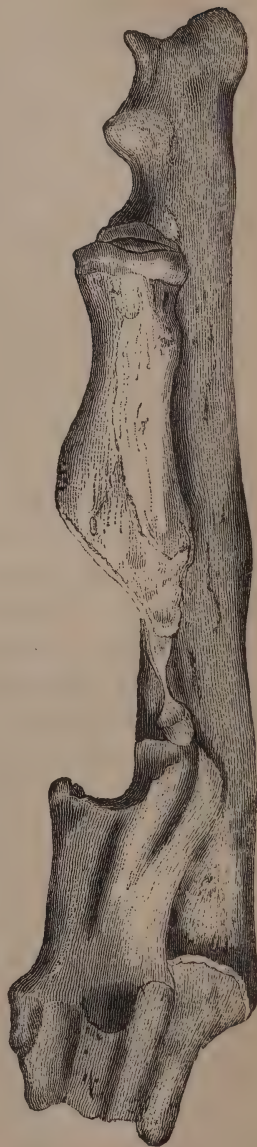




Fig. II.



Fig. III.



were found extended towards each other in a conical form, with a great deficiency of bone between them, and in its place merely a small band of tough ligamentous texture. (Fig. I.)

In the other, where the periosteum had been allowed to remain, there was a compact mass of bone not only occupying the space left by the portion removed, but rather exceeding it. (See Figs. II. and III.) This experiment was repeated, and afforded the same results.

I next exposed the radius of another dog, and separated the periosteum from the bone as in the former experiment; but then, instead of cutting out the denuded bone, inserted a thin plate of metal between it and the periosteum. The edges of the membrane, as well as those of the skin, were sewed together, and the wound healed kindly. At the end of six weeks I dissected the limb, and found a deposition of osseous substance in the periosteum, forming a bony plate exterior to the metal, and not connected with the old bone except by the membrane.

I lastly exposed the radius of a dog, and cut away the periosteum to the same extent that it had been merely detached in the experiment just mentioned, and surrounded the denuded bone with a piece of metal. At the end of six weeks, I found a thick tough capsule formed, enclosing the metallic plate, but having no osseous substance in it.

The evidence which has now been adduced seems to me sufficient for putting beyond all question the power of the periosteum to form new bone, independently of any assistance from the old one. I submit

it, with deference, to the Society, in the hope, that those members who have directed their attention to the subject, will give it their dispassionate consideration, and either admit the opinion which it supports, or show the fallacy by which it has misled.

## ARTICLE V.

## ON ULCERS OF THE LEG.

THE object of the following paper is to offer in a connected form some opinions which I have long entertained, and at different times separately expressed, relative to the treatment of Ulcers affecting the inferior extremities. With this view, these ulcerations may be divided into the Indolent or Callous, the Varicose, and the Mercurial.

The depressed surface and thick elevated edges which characterise the callous ulcer, depend upon a swollen state of the limb, not soft and yielding like that of ordinary œdematous effusion, but of firm brawny consistence. It proceeds from the continued irritation of the sore, usually aggravated by occasional attacks of inflammation, and is therefore apt to attend in a greater or less degree the other sorts of ulceration which occur in the same part of the body, so as, in a corresponding measure, to confuse their distinctive features and diagnosis.

Twenty years ago, the treatment of callous ulcers was believed to have been rendered perfect by combining the modes of management advocated by Messrs Baynton and Whately; the former of whom encircled

the limb, for the extent of an inch or two above and below the sore, with straps of adhesive plaster ; while, by the latter, a roller was applied from the toes to the knee for the purpose of affording general support. This process, from the expense of materials and the attention requisite for their proper employment, is hardly within reach of that rank which chiefly suffer from the disease, except in hospital practice, where cases of this kind, from their monotonous features, slow progress, and proneness to relapse, are admitted with reluctance. So far, therefore, as poor people were concerned, there was in general no efficient remedy available for the relief of callous ulcers.

In 1829,\* I proposed a different plan of treatment, which has now stood the test of sixteen years' trial in most parts of the world, and may I think be regarded in every point of view as preferable to the other. This was to apply a large blister over the sore and neighbouring swelled part of the limb, which has the effect of speedily dispersing the subcutaneous induration and thickening, so as to relax the integuments, and thus remove the obstacle opposed to healing action. In the course of a short time, seldom exceeding a few days after the blister has been applied, the surface of the ulcer, however deep it may have been, is found to be on a level with that of the surrounding skin, not of course through any process of reproduction or filling up, but merely from the removal of interstitial effusion, allowing the integuments to descend from the position to which they

\* Edinburgh Medical and Surgical Journal, vol. xxxiii. p. 21.



had been elevated, as may be readily ascertained by measuring the circumference of the limb, before and after it has undergone the effect of blistering. But, along with this change of form, the ulcer in other respects no less speedily acquires the characters of a healing sore, assuming a florid colour, affording a moderate discharge of purulent matter, and presenting a granulating surface with surrounding margin of cicatrising pellicle. No subsequent treatment beyond the attention requisite for ensuring quiet and cleanliness is needed, and recovery is completed, not only more quickly, but with much less tendency to relapse than when accomplished by other means.

The facility, rapidity, economy, and lasting effect of this treatment, seem to give it a decided advantage over the other methods in use; and, so far as I am aware, no one who has tried the plan ever afterwards hesitated to employ it in preference to any other. In order to derive the full amount of benefit which the practice affords, it must be carried fairly into effect; and with this view, the principle upon which it is founded should be distinctly understood. I still entertain the opinion originally expressed, that the blisters act beneficially by inducing a process of absorption. The enlargement of the limb being of secondary formation, and resulting from the continued irritation of a sore allowed to remain unhealed through neglect or improper treatment, when once established, prevents the contraction of granulating action, by which alone solutions of continuity, not within reach of union by simple adhesion, admit of reparation. Pressure, the horizontal posture, and all other means

that tend to remove the obstacle thus presented, will promote the patient's recovery. But of all the means that can be employed for this purpose, blisters appear to be the most efficient, and should therefore be employed for the remedy, not only of the purely indolent or callous ulcer, but of other kinds, which, in addition to their own peculiar characters, show evidence of complication with indurated enlargement of the limb. From this condition it is hardly necessary to mention that the œdematous swelling of weakness and impeded circulation must be distinguished.

With regard to the Varicose ulcer, I have merely to state that my opinion is not in favour of aiming at what is called the "radical cure," by obstruction of the vein or veins concerned. The ligature of Sir Everard Home, the incision of Sir Benjamin Brodie, and the caustic potass of Mr Mayo, have been succeeded by the much more sure, safe, and effectual method of Velpeau, who accomplishes the object of obliteration, by passing a pin through the skin under the vessel, and then tying a thread tightly round the included part. I have frequently practised this procedure, and never met with any bad consequences from doing so; but am nearly satisfied, from what has fallen within my observation, that the operation is barren of good effects in permanently remedying the tendency to ulceration. If this should prove to be the case, it will be matter of less regret, on account of the improvements which have been made in conducting the palliative treatment, especially by the contrivance of elastic bandages and supports, much more convenient

than those formerly in use ; and by means of which, after the sores are healed, patients may be rendered not only comfortable, but pretty secure against relapse. The *Black Wash* has long seemed to me the best application for promoting cicatrisation of the ulcer. If it comes under treatment in an inflamed or irritated state, poultices should be employed in the first instance, and if the depressed surface and thick edges denote a complication of the callous condition, blistering will be proper instead of such relaxing means.

The Mercurial ulcer of the legs, or that which proceeds from the injurious influence of mercury upon peculiar constitutions of the system, occurs in two different forms, being either superficial and confined to the integuments with their subjacent cellular texture, or deeply seated in the periosteum and surface of the bone. The former is preceded by flattened indurations of the skin, which, after slowly suppurating, discharge their contents by different apertures that communicate together, so as to produce an irregular ulcerated surface, with burrowing sinuses. The latter generally occupies the shin, and is recognised by its firm connexion with the bone, which appears enlarged and irregular, either from really being so, or from the deceptive thickening of its periosteum.

The superficial mercurial sore was formerly treated more by internal than external remedies ; and, like the other effects of mercury co-operating with venereal poison upon unsound constitutions, being regarded as the legitimate offspring of syphilis, received

under the title of antidote a fresh supply of the poison which had given rise to it. The changes immediately attending this most mistaken and mischievous practice, being usually beneficial so far as existing symptoms were concerned, tended to confirm the delusion, which too frequently led the patient by progressive steps of weakness, emaciation, and disease, to his grave. The enlightened views of the late Dr Thomson, gave Edinburgh a distinguished place in reforming this department of medicine; and though the comparatively slow progress of improvement in the capitals of England and Ireland, may still, perhaps, tolerate the administration of mercury for the ulcer in question, it was long since abandoned in this school, and succeeded by treatment of a local kind. This was destruction of the textures concerned by application of the caustic potass, which, at once depriving them of vitality, reduces the parts surrounding and uniting the ulcers to a state of slough; which separates in due time under the employment of poultices, and presents a healing surface of granulations.

This procedure was certainly efficient, but very painful, and often required repetition before recovery could be completed. It therefore readily gave place to the more recent introduction of iodine, as a corrective of the constitutional derangement which gives rise to ulcers of the kind under consideration, as well as to other so-called syphilitic symptoms. Small doses of the hydriodate of potass, such as two grains, three times a-day, administered in simple watery solution, and without any sarsaparilla,—of which I never pre-

scribed a particle, either solid or fluid, in hospital practice,—quickly affords the relief desired, with no assistance except the application of lint moistened with water, or a diluted solution of sulphate of copper, and occasional blistering, especially if there be much thickening and induration.

The deep-seated form of mercurial ulcer which affects the periosteum and surface of the bone, has been, and I fear still is, in some parts of the world, the subject of more unwarrantable and hurtful practice than almost any other surgical ailment, although it admits of treatment peculiarly safe, speedy, and effectual. This is merely the application of blisters over the whole extent of enlargement, followed by the use of simple lotions and gentle pressure, while the hydriodate of potass is administered internally.

At no very distant period, this form of ulcer being attributed to the direct effect of syphilis, was considered a warrant for repeated courses of mercury, and long-continued drenching with sarsaparilla, with benefit, it may have been, to the apothecary's pocket, but with what loss to the patient's health may be imagined, now that mercury is known to be the principal source of the evil it was employed to remedy. The local treatment, also, of those days was hurtful; in the first place, by opening, through means of incisions or caustic, abscesses of the periosteum, which readily admit of absorption, under the same management that proves useful after ulceration has taken place; and secondly, by confounding the rough surface of bone so exposed with that most obstinate of diseases, Caries. Under this erroneous impression, operations



no less severe than unnecessary were performed. I have seen the choffer bristling with cauteries carried into the operating theatre, while unfortunate shin-bones were rasped and chiselled, preparatory to the burning thought requisite for their remedy. I have also known cases which had resisted the prolonged horrors of these rough and frequently repeated proceedings, yield at once to the application of blisters.

But there is reason to fear, that operations still more severe, and if possible still less warranted, have been performed on account of chronic swellings affecting the periosteum and bone, through the proposal of Sir Benjamin Brodie, to trepan the tibia for the discharge of matter pent up in its cancelled texture. The symptoms of this abscess, as described by that gentleman, are enlargement towards one extremity of the bone, pain more or less severe, usually remitting and recurring with increased intensity at variable intervals, induration and adhesion of the integument to the periosteum, tenderness under pressure, especially at particular points; in short, as he remarks with regard to one of his cases, "all the symptoms of chronic periostitis."\* Now, if the two conditions are thus so similar, it is plain that the one which admits of remedy by the use of gentle means may be mistaken for the other, in which, it is alleged, nothing can afford relief except making an aperture by the trephine, for the escape of matter. Several patients, accordingly, have come under my care, after

\* Lectures, p. 397.

being advised in London to allow their tibias to be trepanned, and recovered completely without undergoing any operation. Indeed, Sir Benjamin Brodie says, that, “even if you are mistaken in your diagnosis, no harm can arise from the operation. Nay, it is a question whether good may not arise, under certain circumstances, from taking away a piece of bone when it is affected with chronic inflammation, even though there be no abscess.”\* And he illustrates this view by relating a case in which recovery followed the boring of a hole through the humerus in search of matter, without any being found. But, with all deference to an authority so justly respected, I must protest against the license thus afforded to practise an unnecessary, painful, and, as I believe experience would show, dangerous operation; especially as the affection admitting of remedy by the use of gentle means, is so much more common than chronic abscess in the tibia. I have for many years been looking for this disease, but hitherto without success; and, though not at all disposed to question the reality of such an occurrence, I feel entitled to regard its absence from the field of observation submitted to me, as a proof that it must be a rare event in the practice of surgery.

\* Lectures, p. 410.

## ARTICLE VI.

## ON EXFOLIATIONS OF THE PELVIS.

[FROM THE EDINBURGH MEDICAL AND SURGICAL JOURNAL, 1828.]

EVERY practical surgeon must have observed, that obstinate sinuses are met with nowhere so frequently as in the region of the pelvis. Those which remain after the opening of abscesses depending on carious vertebræ, or caries of the hip-joint, are truly incurable, and being unfortunately of common occurrence, have led to the opinion that little can be done for the remedy of any sinus so situated. The patient is therefore usually committed to the power of his own constitution, nothing being attempted to cure the complaint, except perhaps the occasional injection of some stimulating wash to prevent the appearance of total neglect.

The object of the following paper is to show that the sinuses in question sometimes depend not on caries, but on death of bone, which, exfoliating in some part of the pelvis far from the surface, causes continued irritation by the presence of the loose por-

tion ; whence it is proper, in the treatment of all sinuses in this part of the body not obviously proceeding from caries, to search for such exfoliations, and remove them if they are found to exist.

CASE I.—John Benn, aged seven years, of a pale complexion, but otherwise in good health, has a small fistulous opening in the upper and back part of the thigh, a little below the tuberosity of the ischium. He suffers little pain, but when sitting is observed to rest on the sound hip. His mother states that the complaint commenced without any obvious cause about two years and a half ago, when a tumour, the size of an egg, made its appearance in the seat of the sinus. She applied to a surgeon, who evacuated, by incision, a great quantity of matter. The opening continued to discharge for a year afterwards, when a small bit of bone appeared at the orifice, and was removed by a gentleman, to whom she applied for the purpose. The sinus remained nearly well for six months, when the running again commenced, and has persisted more or less ever since, that is to say, for about a year.

On introducing a probe I detected a loose piece of bone, which was readily extracted so soon as the opening was dilated by incision. The exfoliation appeared, when carefully examined, to have been detached from a spongy bone, and I concluded that the ischium must have been the one concerned, since the sinus would have opened much lower in the limb if it had originated from the femur. The boy got well immediately afterwards.

CASE II.—Soon after meeting with the case just related, I was asked to see a man whose friends believed him to be in a very hopeless state. I found a tall well-made young man, who gave me the following history of his case.

Thomas Irving, aged twenty-eight, a cooper in Leith. About seven years before the time I saw him, after long and severe exercise of the muscles of the thigh, he perceived a sense of uneasiness in the right hip. Soon afterwards a collection of matter formed here, and was evacuated by a surgeon, who informed him that he laboured under a *fistula in ano*, and must have recourse to an operator in Edinburgh, who would soon make him well. Having undergone various incisions, &c., he was told that his complaint was not a *fistula in ano*, and would require time for its cure. He then applied to a quack, who tortured him in various ways too tedious for description. Returning to the regular faculty, he employed a distinguished surgeon of Edinburgh, who opened some large abscesses which formed in the thigh lower down than the original one; but finding that his complaint, though alleviated, was not cured, he determined to abjure all surgical interference for the future, and leave the affair to nature. In conformity with this resolution he permitted the disease to take its own course for several years, working at his business when not prevented from doing so by pain, &c. At last, about two months before the time I saw him, his sufferings became so excessive as to induce a departure from his plan, and he sought the assistance of a surgeon who had attended him in an early stage of his case. This prac-



itioner found a piece of bone sticking at the orifice of a sinus, and removed it ; but having ascertained that there was more to come away, he tried to dilate the opening by sponge tent. The patient in consequence suffered more than ever from the pressure of the sponge, and confinement of the matter. On one occasion the tent slipped in, and required an incision for its removal, which naturally suggested to the patient that the bone might have been more easily extracted in the same way ; but such a proceeding not being, I suppose, in accordance with the old rules of surgery, the tents were persevered in, until the patient, reduced to despair, determined on a change of men, if not of measures, and applied to me.

I found a large diffused abscess occupying the upper and back part of the thigh, and extending from the hip half-way to the knee. In the fold which lies between the hip and thigh, there was an opening which allowed the probe to enter fully three inches in the direction of the tuberosity of the ischium, and at the bottom of this passage I felt a loose piece of bone. The patient was pale and emaciated. Owing to weakness and pain he walked with difficulty ; and the long duration of his complaint, together with its progressive aggravation, rendered him very desponding as to the possibility of recovery.

I made an incision into the abscess of the thigh, and allowed several ounces of pus to escape. Next day I introduced a long straight probe-pointed bistoury into the sinus of the hip, and dilated it to the bottom, so as to admit my finger ; by means of which, I discovered that the exfoliation lay in a cavity be-

tween the origins of the flexor muscles of the knee. Having dilated the mouth of this cavity with the knife, I easily extracted the bone, which was about the size of half a sixpence.

The patient suffered no bad consequence from this operation, and soon found himself relieved from all his previous complaints. In the course of two or three days he walked nearly a mile to my house; and, by the end of two or three weeks, was able to resume his occupation.

Some months afterwards he told me that the sinus still discharged a drop or two of matter, and that he occasionally felt a pricking pain at the bottom of it. I examined with a probe, and ascertained that there was a loose fragment of bone to remove, when I again dilated the sinus down to the tuberosity of the ischium; again felt that the exfoliation lay in a cavity between the tendons; and again enlarged the cartilaginous orifice so as to effect the extraction. The piece of bone now removed was extremely small, not much larger than a barley-corn. The wound healed directly, and the patient has remained free from complaint.

CASE III.—Mr H., a clergyman in the west country, brought his son, a tall thin lad of fourteen, to town, on account of a chronic abscess about the size of the largest orange, which was situated at the upper and inner part of the right thigh, over the origin of the gracilis, &c. This complaint was attributed by the patient to falling into a saw-pit on his side.

As there was no symptom indicating disease of the

vertebræ, I hoped that the abscess would heal after evacuation. At all events there could be no doubt as to the propriety of opening it, which I accordingly advised to be done so soon as the patient returned home.

The abscess was opened without any bad consequence, though it extended very deep between the adductor muscles, but a sinus remained which resisted all the means employed for its cure: tents were introduced; washes were injected; and free dilations of the orifice by incision were performed, but all in vain; and at length the surgeon in attendance intimated that he found his probe ascend into the cavity of the pelvis, and that he could do no more for the case. In these circumstances Mr H. again brought his son to town and placed him under my care.

As there was still no symptom of diseased vertebræ, I strongly suspected that the obstinacy of the sinus depended on an exfoliation. With this impression, I examined very carefully and repeatedly, and at last found one at the origin of the adductor muscles. The probe could be passed far beyond this, but I thought that, since the loose bone was in all probability the origin of the mischief, a cure would follow its removal, and therefore proceeded to effect this without delay.

Having placed the patient on his back, with the thighs drawn up, I dilated the sinus in the direction of the gracilis, and then introduced my finger under this muscle, quite up to the margin of the thyroid hole. I now felt the exfoliation, which seemed to be very small; but all my attempts at extraction proving

fruitless, I enlarged the aperture leading to the bone, and then pushing my finger through, discovered that I had previously been able to feel only a small corner of it, and that the exfoliation, which was of considerable size, consisted of the inner table of the bone composing the thyroid hole. I then easily effected the extraction.

The patient suffered no constitutional disturbance, and returned home in a few days. Though the sinus healed slowly, it did so progressively, and at last his father sent me the pleasing information that it was quite well, and that his son had returned to his studies in the University of Glasgow.

CASE IV.—Ninian Mackenzie, aged twenty-two, a plasterer, in the beginning of November last, asked my opinion as to a complaint which he firmly believed to be incurable. He showed me an opening in the left groin, from which there issued a thin gleety discharge, and around which there were many long cicatrices extending all the way from the pubis to the spinous process of the ilium. He also complained of a painful hardness in the lumbar region of the same side, midway between the last rib and crest of the ilium. There was no external tumour, but a distinct induration could be perceived on pressure, which was very painful. In addition to these complaints he mentioned that his legs were so weak as to prevent him from walking steadily, and that he had frequent desire to make water, with uneasiness in doing so. On desiring to know the history of his case, he gave me the following relation.



Five years ago, the scaffold on which he was working happening to give way, he fell with it to the ground, and received in the fall a blow from one of the planks on his left loin. He felt little inconvenience at the time, and continued at the work in which he was engaged ; but in the course of a fortnight he began to feel pain in the part struck, which gradually increased and extended into the groin, where a tumour about the size of an egg at length appeared, and induced him to enter the Royal Infirmary of this city, two months after the accident. Leeches and other measures of a similar nature were employed, with the effect of removing the tumour, but not the pain. At the end of eight days he returned home, but found himself unable to work for the following fourteen weeks. He then began to do so, when the pain, which had never entirely left him, increased in severity, and in the course of two months became very distressing. At the same time the tumour again appeared in his groin, and he now perceived that his left thigh was drawn up to the body, so that he could not extend it. The swelling then opened spontaneously, and discharged an immense quantity of matter, with great relief to all his uneasy feelings ; but finding that the running continued for five weeks without any abatement, he once more repaired to the Royal Infirmary, where the sinus was injected, and very freely dilated in the groin, so as to occasion the extensive cicatrices already mentioned. At the end of two months he was dismissed as incurable. He went home, and during the five succeeding months was treated by different practitioners of eminence in this city,



without success ; indeed, the means they employed were the same as those found unavailing in the Infirmary, viz. injections. He at last concluded the disease to be hopeless, and abstained from all further surgical treatment, working at his occupation when the pain, &c., allowed him to do so.

This story, together with my own observations, led me at once to conclude that the painful hardness of the loins depended on an abscess caused by, and containing, an exfoliation of bone ; and that if this source of irritation were removed, as the patient was a stoutly made young man, he would soon get well.

Having explained to him my views of the case, I obtained his ready assent to any thing I might think proper for affording him a chance of recovery, of which he was naturally very desirous, not only on his own account, but on that of his wife and family, who depended on his exertions for their support.

In the presence of Drs Mackintosh and Ballingall, I made an incision about three inches long in the left lumbar region, parallel with the crest of the ilium, and, cutting down to the induration, opened an abscess containing a thin fluid. I then introduced my finger, and finding an aperture through the abdominal muscles, searched for the exfoliation, which I soon detected lying on the inner concave side of the ilium, and easily removed by means of a pair of long forceps. Many large sinuses could be felt running in various directions ; but not being able to discover any more loose bones, I concluded that every thing necessary had been done, and therefore dressed the wound.

The patient suffered no inconvenience in the way of constitutional disturbance, but a very copious discharge issued from both orifices for several days : it then grew thick, diminished, and ceased at the artificial aperture. It still continued, however, at the old opening ; and as I found that the sinus descended into the thigh somewhat lower than the orifice in question, I dilated it downwards, after which it also soon healed ; and on the third week from the operation, I showed Mackenzie to my class *perfectly well*, without any pain or uneasiness of any kind, any defect in his power of progressive motion, or any disturbance of his urinary organs.

The history of these cases will, I hope, effect the great object of this paper, which is to excite a more discriminating diagnosis and active treatment of sinuses of the pelvis. As to the origin of the exfoliations, I will not at present say much. It seems very evident that they cannot result from the direct effects of violence, since in all the cases detailed the bone concerned was securely protected by its situation from any such injury. In all of them, if we except the first, where no information could be obtained as to the origin of the complaint, there was violent muscular contraction, and I am inclined to think that this may have been the exciting cause of inflammation and death of the bone. The subject is curious, and worthy of investigation, but of little importance when compared with the practical benefit which may result from a knowledge of the fact, that sinuses of the pelvis sometimes depend on loose exfoliations,

which will not find their way out unassisted, but which may be readily removed artificially with the effect of a speedy and perfect cure.

[SECOND NOTICE FROM THE TENTH REPORT OF SURGICAL CASES. EDINBURGH MEDICAL AND SURGICAL JOURNAL, 1833.]

CASE V.—Andrew Forbes, æt. twenty-six, Lanarkshire, admitted November 16th.—Some years ago, I gave an account in this Journal of several cases in which sinuses of the hip and other parts of the pelvis, that had proved extremely obstinate, and existed for years, were found to depend upon the presence of small exfoliations from the bones. Succeeding observations have confirmed the opinion, that such cases are by no means uncommon, and that, when sinuses in this situation resist the ordinary means of remedy, while there is no evidence of their being connected with disease of the vertebræ, or hip-joint, they may generally be referred to the source in question.

The young man whose case is now to be related, applied on account of a chronic abscess at the upper and back part of the left thigh. There was also a smaller tumour seated over the tuberosity of the ischium, which seemed to contain a fluid; but the fluctuation was less distinct than in the other, and the two did not seem to communicate. The patient had a thin unhealthy appearance; but was quite free from disease, either of the hip-joint or vertebræ, so far as could be determined by a very careful examination. He stated that the swelling in the thigh appeared about two years ago, and gradually increased since;

and that the smaller tumour of the hip was first noticed six weeks previous to his admission.

The lower abscess was opened first; and though after this was done the upper one could not be emptied, nor even diminished by pressure, a communication between the cavities was ascertained to exist in the course of the following week; and then a free counter-opening was made with the knife into the upper tumour, which lay over the tuberosity of the ischium. When this cavity was examined with the finger, it was found to extend to the bone,—a small part of which could be felt bare and rough, but not moveable. In these circumstances, it seemed right to wait for the improvement that might arise from the free drain that had been afforded to the confined matter. Lotions and pressure, applied so as not to close the orifices of the sinuses, were used; but the discharge continued to be very profuse, and the patient's emaciation increased. Hectic symptoms appeared, and apprehensions were entertained for his safety. An improvement then gradually took place, the discharge diminished, and the general health became considerably better. In this state matters remained until the 24th January, when it was resolved to ascertain the precise condition of the diseased bone. With this view, the sinus of the hip was dilated with a bistoury, guided by the finger,—which thus obtaining sufficient room, and being urged with considerable force, penetrated between the origins of the muscles, and detected a loose exfoliation, or rather several small exfoliations lying together. The extraction of these was effected with the forceps, but not without



a good deal of difficulty, owing to the great depth of their situation, and the contraction of the muscles. The patient improved every day after the operation, and was dismissed on the 9th of February.

[THIRD NOTICE.    EDINBURGH MONTHLY JOURNAL OF MEDICAL SCIENCE,  
1846.]

Nearly twenty years ago I communicated, through the medium of the *Edin. Med. and Surgical Journal*, some observations on “Exfoliation from the bones of the Pelvis, as causing the obstinacy of sinuses in this situation.” From the facts then related, it appeared that, in consequence of excessive muscular exertion, or external violence, exfoliation of the ischium and pubis might be induced at the parts of these bones where the extensor and adductor muscles of the thigh are attached, and that the dead portion, from being imprisoned by the dense textures surrounding it, might maintain a discharge of matter for an indefinite length of time. In one case it had done so for six years, and in another for five, with so much exhaustion of the patients, as not only to render them unable for exertion, but to threaten their existence with a speedy termination. As removal of the exfoliation, in these circumstances, was found to afford complete relief, I endeavoured to render the diagnosis between such cases and those of caries in the lower part of the spine, the pelvis or the hip-joint, with which they are apt to be confounded, more careful, by showing that diseases, admitting of easy remedy, might be regarded as incurable, and that by very simple means, patients,



apparently on the brink of the grave, might be restored to health. Since the period of that publication, many cases confirmatory of these observations have come under my notice, and been employed for impressing upon the gentlemen attending my lectures, the importance of discriminating curable from incurable sinuses of the pelvis. But as this subject has not been noticed for a long while in any of my hospital reports, the following instances of the disease may be now related.

CASE VI.—John Robertson, aged thirty, son of a farmer in Perthshire, was admitted on the 13th of December last (1846), in apparently the most hopeless state of exhaustion, from the profuse discharge of matter, through several openings at the lower part of the belly and upper part of the thigh. He presented, in a remarkable degree, the aspect of *tubes dorsalis* in its advanced stage, being extremely emaciated, and having the peculiar pallor of countenance which results from long-continued suppuration. His clothes were saturated with matter, and the stench proceeding from him was more offensive than can well be imagined.

He stated that, sixteen months before, while in perfectly good health, he had been employed for three days in loading carts with sand, and afterwards felt severe pain in the thighs, chiefly on the inner side; that, in the course of two months, there gradually appeared, a little below the left groin, a swelling, which, at the end of two months longer, opened, and discharged a large quantity of matter; that the other

openings over the region of the bladder had been formed subsequently; that he had in vain applied to a variety of practitioners for relief; and finally, that he had come to Edinburgh as a last resource with hardly any expectation of benefit.

Finding that there was no difference, either real or apparent, in the length of his limbs, and that there was no sign of disease in the hip-joint or spine, I suspected that an exfoliation at the origin of the adductors or flexors of the thigh was the source of the discharge; and, upon inserting a probe into the opening left by the abscess, distinctly felt a portion of dead bone. I dilated the sinus by incision upwards sufficiently to admit my finger, and then ascertaining that the exfoliation lay in a cavity formed by very dense texture, partly by cutting with a blunt-pointed curved bistoury, partly by stretching with my finger, I obtained sufficient space to extract two pieces of dead bone, one an inch, the other an inch and half in length, with about half of these extents in breadth. They consisted of spongy or cancellated osseous texture; and one of them appeared to have formed part of the tuberosity of the ischium. I then carefully examined the cavity, and could not discover any more dead or even denuded bone. The patient suffered little during the operation, and nothing after it. He noticed almost directly a diminution of the discharge, which in the course of a few days became so scanty as to occasion no inconvenience. His strength daily increased; and there being now merely a slight oozing from the apertures, while he feels, to use his own expression, "as well as ever," he proposes to return

home in a few days. Had the distance been less, or the season more favourable, he might have done so sooner, though four weeks have not yet elapsed since the exfoliations were removed.

CASE VII.—Alexander Paterson, aged eighteen, from Alloa, was admitted on the 20th of January last, suffering from stricture of the urethra. It was stated that, eight months before, he had been bruised by a very heavy piece of iron machinery which fell upon the pelvis. Extravasation of urine and extensive sloughing of the perineum followed, with the separation of a piece of bone at the end of a month. The sore then gradually healed, but with increasing difficulty of micturition, which at length nearly ceased through the proper outlet, and was effected chiefly by an orifice in the perineum. This opening was situated on the right side, near the hip, in the centre of a large and very firm cicatrix, resulting from the loss of substance caused by the sloughing.

I found a very tight stricture at the bulb; but having succeeded in passing a small bougie through it, carried on the dilatation without entering the bladder, as there was a large cavity behind the contracted part that rendered further progress of the instrument uncertain. Being able at length to introduce a moderate-sized bougie, I carried it on into the bladder, and in doing so encountered a hard substance, not giving the clear ring of stony matter, and which, therefore, I concluded to be a piece of bone. On the 5th of February, having passed a small grooved staff into the bladder, I made a free incision on the left

side of the perineum, the sinus that opened on the right side being so long and tortuous, that a probe could not be conveyed through it to the object of removal. Inserting my finger through the dense and thickened textures, I felt a piece of bone lying in a cavity of cartilaginous firmness, and having dilated the aperture sufficiently, extracted two exfoliations, which together measured two inches in length, and one in breadth. They seemed to have formed part of the symphysis pubis.

After the operation, the patient confessed that he had suffered the greatest distress in attempting to make water, but concealed it, from fear of what might be considered necessary to afford him relief. He felt perfectly easy after the exfoliations were removed, and was dismissed on the 10th of March.

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CASE VIII.—While this sheet is passing through the press, there is before me a curious illustration of the view which it has been my object to explain. A gentleman about thirty years of age, in perfectly good health, two months ago was engaged in a crowd at the entrance of the London Opera House, and though not aware of sustaining any particular squeeze or bruise, found it necessary to exert strong muscular effort for maintaining his place. Next day he felt the left side of his chest painful, with an uneasy catch in respiration, and had leeches applied. At the end of a month an abscess, which pointed near the lower margin of the false ribs, was opened by incision, with

the effect of discharging a large quantity of matter, it was believed not less than a pint. A profuse discharge continued, and, showing no signs of diminution, the patient was induced to come from Berwick-on-Tweed and place himself under my care.

I found that the sinus led in two different directions, downward, under the integuments, nearly to the crest of the ilium, from which the matter issued copiously when pressure was applied, and upwards to the extent of three or four inches, by a deeper channel, altogether within the parietes of the chest. The probe entered this latter passage by a very small aperture, and required to be considerably curved for the purpose. At the summit of the cavity it encountered an exfoliation, which was distinctly felt to be detached, and moveable, though apparently very inaccessible from the circuitous form of the sinus, and thickened state of the superjacent costal parietes.

An attempt was made to effect extraction, by enlarging the orifice and introducing curved forceps, but without success, from the length of the passage, and the narrowness of the intercostal space through which it opened—the ribs being so close that they would not admit even the point of my finger. I desisted from further proceeding in order to consider what should be done, and had nearly resolved to divide one of the ribs to get more room, when two days afterwards, upon examining the sinus, I found that the exfoliation had descended much nearer to the orifice, and it was also obvious that the thickening and induration of the higher part of the chest had greatly diminished. I still could not lay hold of the exfoliation; but on



the following day was more fortunate, and happening to seize it by one extremity, succeeded in extracting it through the narrow space that had been obtained. The exfoliation was about four inches long, and nearly half an inch broad at the widest part. It was slightly curved, and rough as from absorbent action on its convex surface, but perfectly smooth on the other side, so as to prove, if proof were wanting, that it had been detached from the inside of a rib. But this could not have proceeded from the direct operation of external violence; and it therefore seems most reasonable to suppose, that intense and prolonged action of the intercostal muscles occasioned the exfoliation. It may, indeed, be alleged that in this, as well as in the preceding cases, suppuration was the first step of the morbid process, and caused death of the bone through the pressure of matter confined over it. But, independently of other objections to which this explanation is exposed, it may be at once contradicted by the well-ascertained inadequacy of pressure, produced either by solids or fluids, to deprive the osseous texture of its vitality.

## ARTICLE VII.

## REMARKS ON THE TREATMENT OF INCISED WOUNDS.

[EDINBURGH MEDICAL AND SURGICAL JOURNAL, 1827.]

ANY proposal at this time of day to alter the method usually followed in treating incised wounds, may be regarded as unnecessary and presumptuous. British surgeons, I know, pique themselves upon the excellence of their practice in this respect, and will hardly be induced to abandon the old established customs in which they have been educated. But as all improvement would be at an end were such considerations allowed to silence the voice of conviction, the following remarks are, with all deference, submitted to the profession.

When it was the fashion to treat all wounds, however simple and disposed to heal, with an elaborate succession of so-called mundifying—digesting—incarnating—and cicatrizing applications, most of which were more or less escharotic in their nature, but at all events effectually prevented, by their presence, any union except that established by granulation—it is no

wonder that the results of a very different plan, followed by quacks, old women, and other irregular practitioners, who trusted entirely to sucking the wound—balsams applied externally—and incantations—made a deep impression upon people in general, and even the members of our own profession, who were at length induced not only to make themselves acquainted with the proceedings in question, but also to adopt them for the benefit of their own patients.

The success met with was great beyond expectation, It was discovered that wounds could be healed much more simply than had been imagined—and “union by the first intention” became so favourite an expression with the learned, as to afford subject of ridicule to the vulgar.

Many succeeding anatomists and surgeons have investigated the action concerned in primary union. But it is odd enough, that while our ideas have been gradually becoming more and more enlightened as to the process of simple adhesion, our practice has suffered little alteration, and still continues to be tinctured with much of the old superstition and rudeness.

Every incised wound, whether accidentally or intentionally inflicted, after being dressed with plasters and ointments, is bound up with a long bandage. And although the patient soon complains of heat, pain, and oppression, his intercessions for relief are of no avail; the bandage must not be disturbed until the morning of the fourth day, when the long wished-for, much dreaded dressing is to take place. Now it is easy enough to understand why the quacks of old tied up

their patient's wounds for a definite period. They wished to keep at a distance the injurious applications so much confided in by the regular faculty; and for this purpose pretended, that their balsams and incantations could work successfully only in secret. At the same time, prudence dictating the propriety of restraining anxiety and impatience no longer than what was absolutely necessary, while experience taught them, that union by the first intention, if it happens at all, does so within three days;—they fixed upon this as the term of their mysterious process.

But we know that adhesion depends on a peculiar living action,—not upon the virtues of balsams or superstitious observances; and why then do we still obstinately defer the dressing of wounds so long? It may be said by those who do not feel prepared to answer this question—the practice succeeded of old, it does so now; and we are satisfied without troubling ourselves to seek for reasons. But is the practice really successful? Does the surgeon uniformly or even frequently find, when the dressings are first undone, that the wound is healed? To both questions, I answer decidedly in the negative.

When the surgeon with his apprentices, the patient with his friends, are all assembled together on the morning of the fourth day, an anxious and painful scene ensues. Plasters and bandages, warm water and sponges, being duly prepared, the bandage is cautiously undone—no easy matter frequently, when dried blood has glued its different crossings together, and fixed the pins into their places—then compress by compress is taken away, until the

wound lies exposed to view—when pus, which has separated its lips, is seen lying in considerable quantity between the wound and plaster ; or, while the surgeon and bystanders flatter themselves that union has taken place by the first intention, a gush of fetid pus soon puts an end to their premature congratulations. In both cases, it is plain that the corresponding surfaces, instead of being united by primary adhesion, must be as completely detached as if lint had been interposed between them. Indeed, the French practice is much more prudent than our own ; for, laying their account with the formation of pus, they provide a drain for its discharge, and thus prevent the formation of those artificial, frequently extensive and undermining abscesses, which so often result from injudiciously conducted attempts to obtain adhesion by the first intention.

That in this description I have not made matters worse than they really are, will be allowed by all who have seen much operative practice. Many students have assured me, that in the whole course of their hospital attendance they never saw an instance of union by the first intention,—except in cases of cancer or hare-lip, and venesection. And I have ascertained that some do not know what is properly meant by this term, saying, for instance, that a stump which got well in the course of three or four weeks without sloughing or exfoliation, healed by the first intention, though it may have been suppurating freely all along.

Blood being effused from the raw surfaces, and having no opportunity of escaping, causes separa-



tion and distension. Adhesion is consequently prevented, and the parts are roused to a stronger action ; then the patient complains of pain and heat, with thirst, and all the other symptoms of fever—pus is formed, and the abscess is completed. It is not necessary for the prevention of adhesion, that *blood* should be effused into the cavity, since the uniting action is always for the first day, and part at least of the second, attended with a copious discharge of thin serous fluid, which, if retained, acts quite as effectually in preventing the surfaces from adhering ; that is to say, if they be of any considerable extent—for in very small wounds primary union happens, do what we will to oppose it. This copious and continued discharge of serous fluid during the adhesive process, is what I am most anxious to impress upon the reader ; for if this main fact be kept in mind, there can be little difficulty in perceiving why the sealing up of wounds should be the most certain means of keeping them open, or in determining as to the best means of bringing about a different result.

It is plain, that in the first instance no attempt should be made to close the orifice completely—that pressure should be directed to the bottom rather than the outlet of the wound—that blood should not be allowed to crust over the lips ; for though blood may be the best, that is, the least hurtful balsam, I have often known it confine the serous discharges, and so prevent union—and that the orifice should be wiped and kept dry as long as it exudes any moisture.

For attaining these objects, I would recommend in the first place, that when means are required for

keeping the cut edges in contact, stitches should be preferred to adhesive plaster, since their effect is exerted at considerable depth, while they offer little or no resistance to the exit of fluid. Some surgeons employ stitches and plasters together, but this plan is objectionable; for plasters acting only on the surface, always tend to close the lips, or even turn them inwards, while they not only effect no deep pressure, but even render the parts concerned more loose and disposed for the formation of sinuses; and stitches, if put in close enough, may always be rendered equivalent to the effect required. It may be noticed, however, that a little gaping of the edges is by no means hurtful in the first instance, since it ensures a thorough discharge, and may be rectified as soon as adhesion begins.

Secondly, I would advise the disuse of all long, complicated bandages, which cannot be tightened or slackened in part, and removed without disturbing the patient.

Compresses having been laid along the sides of the wound, it will be easy to effect pressure by very simple means, independently of long circular rollers. For instance, in wounds of the trunk, nothing can be more convenient than a broad piece of linen, long enough to cross a little over the breast, and having its two ends torn longitudinally into three or four portions, any one of which may be tightened or slackened as occasion requires, while the whole may be thrown back at a moment's notice.

For wounds of the extremities, a similar bandage, on a smaller scale, will answer equally well; and as

for stumps, I beg to recommend a very simple contrivance, that has often saved me much trouble. A roller is put on as usual, from above downwards, until it has come within a few inches of the stump; and then a few narrow strips of cloth being pinned or otherwise attached on each side, nothing remains to be done but tying them to each other across the face of the stump.

Lastly, I would advise that the surgeon should apply dry lint over the wound, as often as the least moisture is perceived.

If these directions be observed, I feel satisfied, that union by the first intention will become an ordinary occurrence. And of how much consequence this is in most cases of wounds, surgeons need not be told by me.

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The reader of this paper, which was published two-and-twenty years ago, may probably recognise some principles of treatment that since then have been recommended to the profession without any allusion to preceding observations. At the time when this paper originally appeared, my practice was to delay the dressing of wounds until the evening, or at least until several hours had elapsed after their infliction, lest distension should be caused by the bloody or serous effusion being retained by immediate approximation of the lips, even though not covered by any impermeable material. But finding that this method proved inconvenient by disturbing the patient, and by

sometimes causing a renewal of the bleeding, I have for many years endeavoured to adopt measures, in the first instance, consistent with what seemed to be the proper principle of treatment, and free from the objections just mentioned.

The great essentials for primary union appearing to be approximation of the raw surfaces sufficiently near to place them within reach of the adhesive action, and prevention of their displacement by the accumulation of fluid between them, the different circumstances of wounds afford room for varying the modes of their management. In those penetrating the mouth, through the cheek or lips, the cavities of the trunk, or the joints, the raw surfaces may be at once accurately brought together at their external edges by the interrupted or twisted suture, without any risk of subsequent separation by fluid effused between them, since there is space for its reception at the inner side of the wound. But in wounds opening upon only one surface, and more especially those of considerable depth, or situated in parts opposed to accurate coaptation, the dressing should be applied with a view rather to compress the sides of the cavity than to close its orifice. Stitches may be employed to assist in regulating the position of the cut edges, but not so as to confine them in close contact; and compresses of dry lint, or other bibulous material, must be carefully employed to retain the raw surfaces in due position, without impeding the discharge of blood or serum. One or more soft and moist, and carefully squeezed sponges, I find extremely convenient for this purpose, especially in regions of

the body where the textures, entering into the formation of the parts concerned, are such as to impede the efficient action of pressure. After removing tumours from the upper or lower triangle of the neck, in the neighbourhood of the parotid gland or clavicle, I have by this means obtained union by the first intention, when it could hardly have been expected. In amputations at the ankle joint, I have in like manner experienced great advantage from a hollow sponge, sufficiently large to receive and contain the stump.



## ARTICLE VIII.

## ON THE PROCESS OF GRANULATION.

[SECOND REPORT OF THE EDINBURGH SURGICAL HOSPITAL 1829.  
EDINBURGH MEDICAL AND SURGICAL JOURNAL, 1830.]

It is a common remark, that the things which lie most within our sphere of observation are least attended to, and there is no better illustration of this than the subject which I now propose to discuss. Every wound, when it does not unite by the first intention, and every ulcer, if it heals at all, heals by granulation, and yet nobody takes the trouble of inquiring into the precise nature of this process, every one being satisfied with the vague account of it which is to be found in surgical books.\* The statement generally contained in these is, that lymph, being effused on the surface of an abscess, wound, or ulcer, becomes organized, and formed into a layer of small, red-pointed, fleshy granulations; from these pus, together with coagulable lymph is secreted, and the new crust of organizable matter is in its turn converted into

\* This was written in 1829.

granulations. “ In this manner layer after layer is formed, until the cavity is filled up.”\* Such is the explanation usually given, and as generally considered satisfactory.

Instead of attempting to disprove the accuracy of this description of the mode in which losses of substance are repaired, I will at once endeavour to show, that the alleged reproduction does not really occur; that the appearances which are thought to establish its reality are delusive; and that, therefore, the explanation employed to account for it is equally unnecessary and erroneous.

The subject of Reproduction or Incarnation engaged the attention of the French Academy of Surgery; and the memoirs of its members, Fabre and Louis, leave little wanting with regard to its history. How they have happened to be so completely forgotten in modern times as to permit the old doctrine of regeneration to revive and flourish, to the suppression of the truth, I cannot tell; but I shall attempt to place the matter once more in a clear point of view.

The arguments in favour of reproduction by granulation are, 1. the regeneration of lips, tongues, and the glans penis, completely or partially destroyed; 2. the filling up of abscesses or sinuses; and 3. the healing of wounds attended with loss of substance.

When we come to enquire into these alleged proofs, we find, that of regenerated lip there is only one instance on record; and if M. Louis's account be correct, not much weight ought to be

\* Sir Astley Cooper's Lectures, Vol. i. p. 161.

placed on it. Louis says, that M. Pibrac and he were invited to visit this famous lip, in order to satisfy themselves of its actual regeneration. The loss of substance, they were told, had been so great that it was impossible to unite the cut edges; that it had even been necessary after the excision to apply the actual cautery to the roots of the disease; that eventually the patient was cured; that the lip was restored; and that they should be lost in admiration of this wonderful work of nature. "We visited the patient," says he, "and saw nothing at all extraordinary. The patient had been freed from a tumour, the extirpation of which might at first sight have seemed to require removal of the whole lower lip. But it is well known that when a part is much swelled, a large portion may be taken away without diminishing its natural extent; and this is just what had happened in the case under consideration. The lip, properly speaking, was completely wanting, so that the teeth and gum appeared through the breach. *The loss of substance had not been repaired.* A perpendicular cicatrix denoted that the lower part of the wound had been closed by the union of its edges. The patient was unable to retain his saliva, and the skin of the chin, which had been drawn up to supply the lip in part, and which had been mistaken for the product of regeneration, was covered with its characteristic *beard*. The great breach caused by the operation had been in some measure closed by contraction, but not one particle of the lost substance had been regenerated."

If this be the true account of the lip, I certainly feel inclined to agree with M. Fabre, that the "well

formed proportioned glans," which Mr Jamieson of Kelso had the pleasure of seeing reproduced after "amputating the balanus preputium, and a small portion of the corpora cavernosa penis," was nothing more out of the ordinary course of nature than the original glans itself, which had been concealed from sight by the swelled and gangrenous prepuce. If the alleged reproduction admits of this explanation in regard to the lip and glans penis, it is evident that we should pay little attention to the evidence afforded by the separation of sloughs from the tongue, where it is so difficult to ascertain the extent of destruction and also of restoration, owing to the great extensibility of the tissue composing this organ.

As to the filling up of abscesses, it ought to be recollected that the cavity which contains the pus is not formed by the destruction of any tissue, but by distension of the skin and subjacent organs, whence evacuation of the fluid is followed immediately by such collapse and approximation of the surrounding parts as nearly obliterates the hollow. And where there is really a destruction of cellular substance, as in the abscesses of weakly children, a permanent depression remains after the cure is completed. Sinuses are healed on the same principle, viz. by coalescence of the sides; and every attentive practitioner must have observed the great advantage of laying them together by means of proper bandages, so soon as they are disposed to unite.

Lastly, as to the healing of ulcers or wounds attended with loss of substance, it is well known that the resulting cicatrix is always smaller than the origi-

nal sore ; and that there is invariably a depression of it proportioned to the destruction of parts. M. Fabre quotes the case of a wound in the thigh destroying the muscle and exposing the bone, the cicatrix of which rested directly on the bone without the interposition of any newly-formed substance. It was a similar case which led my attention to this subject. M. Bezoet of Rotterdam, who wrote against the doctrine of reproduction, appeals to a case of wound in the head, where a portion of the scalp was removed, and where, notwithstanding the most luxuriant granulations, the cicatrix rested on the bone. I have in my possession several skulls, with the scalps, from which portions of bone had been removed, artificially and naturally. One of these belonged to a gentleman who was attended by myself, and in all of them the cicatrix is but a pellicle resting on the bone or *dura mater*.

When amputation was performed in the old way, by cutting directly through all the parts, a very large granulating surface resulted, which ought to have become larger if there really was a growth of new substance, so as to form the stump into a bulbous figure. But it always happened, on the contrary, that the cicatrix was much smaller than the wound, and that the stump, so far from being bulbous, was of a sugar-loaf or conical form.

We have frequently an opportunity of dissecting a granulating sore after death or amputation. And do we then find any such appearance as the common description would lead us to expect ? Do we find successive layers of granulations, or any considerable



thickening of newly-formed substance? I have made many such examinations, and could never perceive any thing but a thin layer of organized matter covering the surface.

How, then, are wounds healed by granulation?

Lymph being effused over the surface and organized into a granular pellicle, lymph and serum are effused into the subjacent cellular tissue so as to distend it more or less. In what is called a healthy granulating ulcer, the quantity is very small, so as hardly to affect the elevation of the surface, or induration of subjacent parts; but when the process proceeds in a morbid manner, then many remarkable phenomena are thus induced.

For instance, when the ulcer is defective from weakness, the granular surface is distended by effused serum under it, and elevated into soft spongy projections, the proud flesh of the vulgar. This œdematous state of the sore is usually accompanied by a similar condition of the limb or other part in which it is seated; no trace of these fungosities is to be found after death; pressure restrains them as effectually as it does the œdema of the limb; and they suddenly subside under the action of what are called escharotics, without leaving any remains in the place they occupied. These observations afford satisfactory evidence of their real nature, which I had lately an opportunity of illustrating still more convincingly. William Brown entered the hospital on the 27th of October, to obtain relief for a most extensive and frightful sore of the leg. It had existed for seven years—it stretched from the middle of the calf, on

the back and both sides of the limb, to the heel. There was great general swelling—enormous fungous growths—complete inability of motion—in short, such a formidable appearance as led the patient, and most of the medical men who saw him, to conclude that amputation afforded his only chance of remedy. A large blister was applied, and the state of matters soon underwent an extraordinary change for the better. The swelling of the leg subsided—the fungosities disappeared, and the sore, now greatly diminished in extent, assumed a healing appearance. At the end of two weeks from his admission, I desired him one morning to try if he could walk. When he had accomplished a few steps, I observed the blood trickling from the ulcerated surface; and, on observing it more closely, discovered a number of dark-coloured eminences which had not existed previously. They varied in size from that of a pea to that of a nut. When squeezed roughly they suddenly burst, and collapsed with effusion of blood. When pressed more gently, the pellicle forming them could be distinctly traced over the adjacent granulating surface, where a similar appearance was produced by the blood forced out of the little tumours formed in the first instance. It is difficult, I think, to conceive a more satisfactory proof of the true nature of a granulating surface than this observation; which I am very much surprised should not have been made before.

In those sores, again, which have something specific in their action—something capable of contaminating other parts of the system, either by absorption or extension of action, there is an effusion of lymph

into the subjacent and surrounding cellular substance, which occasions the indurated and elevated edge so characteristic of such sores.

In other ulcers, as those occurring in scirrhus and medullary sarcomatous textures, lymph is effused under the granulating surface, and, becoming organized, elevates it into fungous excrescences. And here I dare say it will be asked, If morbid structures are produced, why cannot the healthy tissues be regenerated? To which I answer by asking, Since the legs of salamanders and lobsters are reproduced after removal, why are not the limbs of man also reproduced? In studying the operations of nature, we ought always to prefer facts to mere reasoning.

The granular surface being formed, so as to seal up the interstices of the body and serve as a temporary integument, the process of healing proceeds by levelling the sore with the surrounding skin. The slight effusion which, as already mentioned, takes place under the granulations, assists in this; but the effect is chiefly produced by absorption, consequent emaciation, and shrinking of the surrounding tissues, especially the fat. So soon as the surface of the ulcer, or the edge of it at least, is on a level with the skin, the absorbing process goes on more rapidly, removing the interstitial particles of the granular pellicle and subjacent tissue, and thus diminishing the area of the sore. In illustration of this part of the process I may remark, what every attentive surgeon must have observed, that the cicatrix of ulcers is smallest in those parts of the body where the integuments are most lax, as the scrotum, the abdomen, the mamma;

and that it is largest where the skin, from its firm connexion, is most unyielding, as the thorax, the cranium, the shin, &c.

The cicatrix is formed of the granular pellicle and subjacent cellular substance, which has been indurated by the effusion of lymph into its areolæ. Its thickness varies with circumstances, but always diminishes after the cure seems to be completed; whence, though on a level with the surrounding skin when first formed, it ultimately becomes lower, so as to constitute a depression; but this appearance is no doubt partly owing to the surrounding parts recovering from the emaciation, which, as above mentioned, takes place in the first instance as a step towards the cure.

## ARTICLE IX.

## ON EXCISION OF THE SHOULDER JOINT.

[FROM THE EDINBURGH MEDICAL AND SURGICAL JOURNAL, 1826.]

CHRISTIAN LAING, æt. thirty-eight, married, the subject of the following case, was recommended to my care by Dr Belfrage of Slateford, about the middle of last summer, (June 1825.)

She complained of her left shoulder, the articulation of which was nearly immoveable, though the perfect mobility of the scapula rendered this not very obvious. There was a small opening directly under the extremity of the acromion, about half-way between that process and the humeral attachment of the deltoid, and there was another of similar appearance, situated over the clavicular portion of the pectoralis major, about the middle of its course. Both of these openings led to extensive sinuses, which allowed the probe to pass obliquely towards the joint, but not to reach the bone. The discharge was thin and copious. The integuments were nearly natural. The acromion and coracoid processes seemed to be enlarged; but,



in other respects, there was not much swelling about the joint. The limb was entirely useless, being kept constantly suspended in a sling. The patient stated, that she occasionally suffered much from shooting pains in the shoulder, and extending thence down the arm even to the fingers. She was a healthy-looking woman, apparently somewhat exhausted by anxiety and suffering, but had no particular complaint except that just described.

On inquiring into the history of the disease, I was told that it had commenced six years before, in consequence of falling from a wall, about two feet high, upon the shoulder, the effect of which accident was pain, and stiffness of the joint, gradually incapacitating her for work—and at length inducing her, after five years of great, though unpitied, suffering, there being no visible imperfection, to employ a bone-setter, who used very rough measures, and no doubt aggravated the mischief. In the course of the succeeding year, a large abscess on the fore part of the joint was opened by an eminent surgeon in town. On returning home to Rosslyn after this operation she caught cold, and was confined to bed for six weeks. Another abscess then formed, and opened naturally not long before the time I saw her.

From an attentive consideration of all the circumstances now detailed, I strongly suspected that the bones of the joint were diseased, and that a severe operation would be required for restoring the patient to health. But not seeing any reason for haste, and being very averse to proceed rashly in so important a matter, I contented myself with dilating the sinuses,

and recommended her to call upon me occasionally. Not long afterwards, I opened an abscess in the axilla; and then, as her health became a good deal impaired, I advised a return to the country.

I saw nothing of the patient until the beginning of last March, when I was asked to visit her at Slateford.

She seemed to me much thinner and weaker than formerly; but the joint was little altered, excepting that, in addition to the sinuses already mentioned, there were two more, viz. one in the axilla, remaining after the abscess I opened there, and another on the posterior part of the joint, just above the margin of the axilla, resulting from an abscess discharged in the Royal Infirmary, whence she had been discharged two months before, after a residence of several weeks. She now suffered more than ever from an almost incessant gnawing pain; slept ill; had little appetite; and found herself becoming every day weaker, owing to a troublesome diarrhœa.

Though it was still impossible to pass a probe through any of the sinuses to the bone, and though no crepitus could be perceived when the joint was made to undergo that slight degree of motion which it still admitted, I, nevertheless, now felt fully satisfied that nothing but an operation afforded any chance of relief, and accordingly proposed to cut down upon the joint, to ascertain its condition, and then remove the diseased bone alone, if possible—or, together with the limb, if circumstances should render this necessary. It was agreed, however, that nothing ought to be done in the mean time, as the digestive functions were a good deal disordered.

In the course of a fortnight, the patient's general health being much improved, through the kind and skilful care of Dr Belfrage, I requested my friend Dr Dease, surgeon to the forces in North Britain, to examine the state of the joint; and he coinciding completely with me as to the necessity and practicability of an operation, I determined on performing it without further delay.

On Saturday the 1st of April, assisted by Dr Dease, and in the presence of several friends and pupils, I proceeded as follows:—

The patient being seated on a chair, I made a perpendicular incision from the acromion through the middle of the deltoid, extending nearly to its insertion, and traversing one of the old sinuses. Introducing my finger into the opening thus made, I felt that the disease was chiefly, if not entirely, confined to the head of the humerus; and therefore, cutting in a semilunar direction, backwards and upwards, from the lower extremity of the first incision, I formed a large flap from the external or scapular portion of the deltoid, which being held up, exposed the joint so far, that I was able to insulate the head of the bone by means of my finger, and then to detach the scapular muscles from their connexions with the tuberosities, when, the arm being brought forwards, I easily thrust out the head of the humerus, and sawed it off without any injury to the soft parts.

I next examined the scapula, and had the satisfaction of finding the glenoid cavity perfectly sound, though deprived of its cartilage. The coracoid process also seemed to be free from disease;

but as the acromion at its extremity was bare and rough, I removed a portion of it with the cutting pliers.

On making the first incision, there was a rather alarming gush of blood ; but the only artery of consequence divided during the operation was the posterior circumflex, which Dr Dease compressed with his finger until I completed the excision. This vessel was then tied, and the flap replaced, and retained in perfect apposition by five or six stitches of the interrupted suture. The only additional dressing consisted of some lint compresses, and two or three turns of a bandage.

The whole operation, including the application of the ligature and insertion of stitches, occupied ten minutes. The patient bore it remarkably well, and lost very little blood. She passed a quiet day, and had a good night. Next morning I removed the dressings, and replaced them, with a few slips of lint, over the lips of the wound, which were generally adhering. I visited the patient on Monday, and was told that, on the preceding evening, she had had a slight rigor, which lasted for a quarter of an hour, and had been restless through the night. The pulse was 110, her skin hot, and her tongue dry. There was a diffused redness, and slight swelling of the arm, between the wound and elbow. I immediately bled her to fourteen ounces, and directed small quantities of a weak antimonial mixture to be taken frequently.

On Tuesday there was no complaint but thirst and nausea. The wound was generally adhering ; but



at the site of the old sinus, under the acromion, a dark-coloured and fetid discharge issued in considerable quantity.

On Wednesday, the erysipelas was subsiding.

On Thursday I was informed, early in the morning, that, during the evening before, the patient had become suddenly so weak as to alarm those about her, who were induced to give a little wine, from time to time, through the night. When I saw her, she was considerably recovered. However, as there was no fever remaining, and she expressed a desire for food, I prescribed beef-tea, arrow-root, &c., in small quantities taken frequently.

On Friday, she was better in all respects ; the discharge was diminished and less fetid.

After this the recovery advanced regularly and rapidly, so that by the end of the second week she was able to move about a little. In the course of two weeks more, the wound was healed, though the sinus continued to discharge for some time longer. Indeed, the one of oldest formation still affords a small quantity of matter—but this, I have no doubt, will soon cease. In the mean time, the patient is, as she has been ever since the operation, entirely free from pain. The limb is shortened somewhat less than an inch ; it is no longer supported in a sling, and the shoulder joint is susceptible of distinct motion, in all directions, by means of its own muscles—while all the other joints are as serviceable as they ever were.

On examining the portion of bone removed, it appeared that the head of the bone was hollowed



out into a large cavity, so that there remained but a mere shell, which externally, though divested of cartilage, seemed to be healthy, but internally displayed very distinctly the characters of caries, appearing as if lined with slender pyramidal, or rather needle-shaped spicula, projecting towards the centre. Previous to maceration, this cavity was lined by a thick and vascular membrane.

This case—in which a disease of the shoulder joint existing for seven years, rendering the arm entirely useless, embittering the patient's life, and at last threatening to destroy it, was effectually remedied by excision of the diseased bone—I submit to the public, confidently hoping that it will have the effect of recalling attention to the bold, but prudent and successful, innovation of White.

Soon after White of Manchester published his case in the Transactions of the Royal Society, nearly sixty years ago, Mr Bent of Newcastle, and an eminent surgeon of Chester, Mr Orred, followed his example with success. But, since that time, though the preservation of a limb, more especially of one so useful as the arm, must be a great object to all practitioners, no British surgeon, so far as I know, has recorded a single instance in which caries, or other disease of the shoulder, has been remedied by excision of the bone.\*

\* Excision of the comminuted bone has been frequently performed by military surgeons in gun-shot wounds of the shoulder joint. Baron Larrey is of opinion, that when a ball traverses the limb, so as to detach the head of the humerus from its shaft, either excision or amputation is absolutely necessary for saving the patient, and has accordingly per-

It cannot be supposed that the cause of this deficiency has been want of opportunity, since amputation at the shoulder joint for caries is an occurrence by no means rare in civil practice ; and I must attribute it entirely to prejudice against the operation, arising probably from fear of the difficulty and danger attending its performance.

The difficulty of the operation depends in a great measure upon the manner in which the flaps are formed.

White, Larrey, and Charles Bell, advise a single perpendicular incision from the acromion, and this will suffice when the soft parts are healthy, when the bones are recently comminuted, or when the head of the bone has been much diminished by disease, as in White's case.\*

Bent made a perpendicular incision, commencing about midway between the acromion and coracoid

formed the former operation in such cases ten times. The practice of British surgeons affords reason for questioning the truth of this position, and excision has been less often performed by them.

In the seventh volume of the Medico-Chirurgical Transactions, there is a very interesting case detailed by Mr Morel, in which he preserved a soldier's arm by removing the fragments resulting from a gun-shot wound, inflicted five months before at the battle of Waterloo. The case is particularly interesting, in so far as it was performed several months after the injury had been sustained, when of course the difficulty of operating was infinitely greater than it would have been in the first instance. The excision alone occupied three quarters of an hour, and two pounds of blood were lost.

\* Some have alleged, that, in Mr White's case, the head of the bone was not removed, but being detached from the shaft by disease, remained in its place, so as to unite with the regenerated shaft, and thus restore that perfect articulation which seems otherwise no less extraordinary than inexplicable.

processes, and then cut inwards or towards the sternum from both extremities, so as to form a flap from the clavicular portion of the deltoid and the pectoralis major ; a proceeding certainly very dangerous to the axillary vessels, &c., and, as I should think, not at all convenient.

Sabatier proposed to extirpate a portion of the integuments and deltoid, of a V shape.

Moreau made a square flap from the deltoid, turned it down, and then, if necessary, gained more room, by extending the transverse incision in both directions.

Morel made a semilunar incision with its convexity downwards, so as to form a large flap from the deltoid.

The method I followed seems preferable to all of these, and others that I might mention, as being easy, rapid, and effectual, endangering no large vessel, leaving a part of the deltoid entire, so as to support the arm, and allowing the insulated head to be protruded with perfect facility.

The difficulty of operating depends farther upon thickening and induration of the soft parts, owing to the long-continued irritation in their neighbourhood, which prevents natural retraction and easy dissection. This morbid change certainly does complicate the matter considerably ; but provided the flap is properly formed, the surgeon will not be prevented by this cause from effecting his purpose readily and easily. In the case just related, the change in question had been going on for seven years, and yet the excision was completed in three minutes,—a sufficient proof that the difficulty encountered could not have been very great.

As to the danger of the operation, I believe there has been much groundless apprehension, from forgetting the difference which exists between the condition of a diseased and that of a healthy joint. In an old case of caries, the whole articulating apparatus, so ready, when healthy, to resent any violence offered to it, is removed, and the only parts injured in cutting out the bone are those concerned in an ordinary case of amputation; but when it is recollected, moreover, that all the great vessels and nerves are left untouched in the case of excision, no one surely will maintain that this is a more severe operation than removal of the arm.

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This patient survived the operation ten years, during which she enjoyed perfectly good health, and the full use of her arm, with which she was able to sew, knit, and do all ordinary domestic work, without any feeling of uneasiness or perceptible defect. After her death I had an opportunity of examining the parts concerned, and found a firm ligamentous texture uniting the bones, so as to prevent undue mobility, but permit motion in all directions to the ordinary extent. It may be remarked that, while she had the perfect use of her hand and fore-arm, and could move her arm at the shoulder backwards and forwards, she did not regain the power of raising the limb directly from her side, by the muscles of the shoulder, but experienced no inconvenience

from this source, as, by a sort of climbing action with the hand upon her dress, she elevated her arm so quickly and easily, as to elude the most careful observation.

The successful result of a case so unpromising, that it had been dismissed as incurable from the Royal Infirmary, and was considered hopeless by every surgeon who had seen it, rendered me sanguine in the expectation of advantage to be derived from the revival of an operation which had not been performed by any contemporaneous British surgeon for the removal of caries. But the results of succeeding experience corrected the estimate thus formed, by showing that the scapula is apt to suffer from the disease too extensively to allow complete extirpation of the morbid part, without the free access to it which is afforded by amputation of the arm. In the case of a young gentleman suffering from caries of the shoulder joint, whom I saw with Dr Anderson of Leith, and in that of another patient, about fifty years of age, whom I saw with Dr Chisholm of Inverness, I found it necessary, after amputating at the shoulder joint, to take away not only the whole of the glenoid cavity, but also a considerable portion of the neighbouring bone. In both of these cases, which proved completely successful, I feel persuaded that excision could not have been effectually accomplished, and in all probability would have proved fatal, by causing a profuse and prolonged discharge, which the patients were in a state little able to bear. It therefore seems requisite to exercise great caution in undertaking an operation to save the limb when



caries is ascertained to exist in the shoulder joint. The probe affords little, if any, information, and it is the history of the case, together with the situation occupied by sinuses or abscesses, that constitute the best grounds of judgment. Cases commencing with ulceration of the cartilages, and those in which the matter has made a way for itself, not over the scapula, but into the axilla, or down the arm, are the most favourable for the purpose. In performing the operation the glenoid cavity should be completely exposed, so that the neck of the scapula may be divided by powerful cutting pliers with long blades.

Mr White of Manchester has had attributed to him the credit of performing excision of the shoulder joint, for the first time, although the case in which he was supposed to have done so appeared in several respects rather obscure and questionable. It happened to be in my power to clear away this uncertainty, by showing, beyond the possibility of question, that the case in which Mr White operated was necrosis and not caries; and that, instead of cutting out the head of the humerus, he had merely accelerated the separation of an exfoliation from its shaft. As the subject, independently of historical interest, is in itself important, I may here quote the explanation offered in my *Treatise on the Excision of Diseased Joints*, and then the practical observation which proved the opinion there expressed to have been correct.

[FROM TREATISE ON THE EXCISION OF DISEASED JOINTS, 1831, p. 40.]

In 1768, Mr White of Manchester treated a case, of which he gives the following relation :—

“ Edmund Pollit, of Sterling, near Cockey-Moor, in this county, aged fourteen, of a scrofulous habit of body, was admitted into the Manchester Infirmary, April 6, 1768. The account I received with him was, that he had been suddenly seized about a fortnight before, with a violent inflammation in his left shoulder, which threatened a mortification, but at last terminated in a large abscess, which was opened with a lancet a few days before his admission. The orifice was situated near the axilla, upon the lower edge of the pectoralis major, and through it I could distinctly feel the head of the os humeri, totally divested of its bursal ligament. The matter, which was very offensive, and in great quantity, had made its way down to the middle of the humerus, and had likewise burst out at another orifice, just below the processus acromion, through which the head of the os humeri might easily be seen. The whole arm and hand were swelled to twice their natural size, and were entirely useless to him. He suffered much pain, and the absorption of the matter had brought on hectic symptoms, such as night sweats, diarrhœa, quick pulse, and loss of appetite, which had extremely emaciated him.

“ In these very dangerous circumstances, there seemed to be no resource but from an operation. The common one in these cases, that of taking off the

arm at the articulation with the scapula, appeared dreadful, both in the first instant and in its consequences. I therefore proposed the following operation, from which I expected many advantages, and performed it on the fourteenth of the same month. I began my incision at that orifice which was situated just below the processus acromion, and carried it down to the middle of the humerus, by which all the subjacent bone was brought into view. I then took hold of the patient's elbow, and easily forced the upper head of the humerus out of its socket, and brought it so entirely out of the wound, that I readily grasped the whole head in my left hand, and held it there till I had sawn it off with a common amputation saw, having first applied a pasteboard card betwixt the bone and the skin. I had taken the precaution of placing an assistant, on whom I could depend, with a compress just above the clavicle, to stop the circulation in the artery, if I should have the misfortune to cut or lacerate it; but no accident of any kind happened, and the patient did not lose more than two ounces of blood, only a small artery which partly surrounds the joint being wounded, which was easily secured.

“He was remarkably easy after the operation, and rested well that night; the discharge diminished every day, the swelling gradually abated, his appetite returned, and all his hectic symptoms vanished. In about five or six weeks *I perceived the part from which the bone had been taken had acquired a considerable degree of firmness, and he was able to lift a pretty large weight in his hand. At the end of two*

*months, I found that a large piece of the whole substance of the bone that had been denuded by the matter, and afterwards exposed to the air, was now ready to separate from the sound, and with a pair of forceps I easily removed it. After this exfoliation the wound healed very fast, and on August 15, he was discharged perfectly cured. On comparing this arm with the other, it is not quite an inch shorter; he has the perfect use of it, and not only can elevate his arm to any height, but likewise perform the rotatory motion as well as ever. The figure of the arm is noways altered, and from the use he has of it, and its appearance to the eye and to the touch, I think I may safely say the head, neck, and part of the body of the os humeri are actually regenerated.*

*“I could not help being surprised to find so much strength and firmness, as evidently showed a regeneration of the bone, before the lower part had exfoliated, or even before it had begun to loosen. The osseous matter could not proceed from the scapula, the glenoid cavity of that bone not being divested of its cartilage. Could it then possibly escape from the end of the sound bone, before the morbid part had begun to separate from it? Or are there any vessels that could convey the bony matter, and deposit it in the place of what had been removed.” \**

I have put some expressions in italics, which seem to me of importance in explaining the true nature of this case. It is quite clear, from an attentive consideration of it, that it was not one of caries, but an

\* Cases in Surgery, by Charles White. London, 1770, p. 57.

instance of that acute necrosis which is so frequently met with in the finger, and occasionally also in the larger bones (See first Quarterly Report of the Edinburgh Surgical Hospital, Ed. Med. and Surg. Journal, 1829). This will account for the facility of the operation and also its great success, particularly in respect to the length of the limb, which was not diminished. In all the other cases of excision which have hitherto been published, there was uniformly a degree of shortening proportioned to the extent of bone removed, yet, though nearly four inches were taken away by Mr White, the limb was not perceptibly shortened. It may be asked how is the explanation easier on the one supposition than on the other? Why should new osseous matter be effused to repair the loss of substance caused by necrosis, and not after the excision of bone? These are difficult questions, and the only answer to them that I can offer is the well-known fact, that there is a much greater disposition for the effusion of new bone in the one case than in the other. It is probable, too, that the foundation of a substitute may have been laid previously to the operation;—indeed, it is quite clear that this must have been the case with regard to the second portion removed by Mr White. My reasons for giving such particular attention to this case, are, *first*, because it led the way to all that has been done in this department of surgery; and *secondly*, because erroneous opinions regarding its real nature, arising from the superficial consideration of it, have rendered the result so difficult of belief, as to throw an air of absurdity over the whole subject.



[REPORT OF SURGICAL CASES. EDINBURGH MEDICAL AND SURGICAL JOURNAL, 1836.]

*Necrosis of the head of the Humerus—Removal of the Exfoliation—Recovery.*—In 1769, Mr White of Manchester, read before the Royal Society a “case in which the upper head of the os humeri was sawn off, a large portion of the bone afterwards exfoliated, and yet the entire motion of the limb was preserved.” —The patient was a boy of fourteen years of age, who “had been suddenly seized about a fortnight before with a violent inflammation in his left shoulder, which threatened a mortification, but at last terminated in a large abscess, which was opened with a lancet a few days before his admission.” Through this opening, and another that had formed spontaneously under the acromion process, the os humeri could be felt and seen “totally divested of its bursal ligament.”

Mr White made an incision from the acromion process half-way down the arm, protruded “the head of the bone” through the opening thus obtained, and sawed it off in the form here copied from his engraving.



At the end of two months he found that a large piece of the remaining bone had become loose, and easily removed it with a pair of forceps. The patient was perfectly cured at the end of four months from the operation. The arm was then not quite an inch shorter than the other, and he had the perfect use of it. In a work published some years ago,\* I expressed my persuasion that this was not a case of caries, as it had generally been regarded, but one of acute necrosis; and the following very curious companion to it at a more advanced stage, seems strongly corroborative of that opinion.

Thomas Cairns, aged thirteen, from Saline, recommended by Mr Craig of Ratho, was admitted on the 30th of June, on account of a great enlargement of the right shoulder, attended with pain and discharge of matter. It was stated that ten months before, he had fallen from a wall about four feet high among loose stones, and afterwards had been pretty severely handled by a bone-setter, who alleged that the humerus was broken near the joint. Inflammation and suppuration followed, openings for the discharge of matter took place at various parts, the joint became stiff, and the patient's strength declined. In these circumstances, he was sent to town to be under my care.

As it was impossible to obtain any satisfactory information in regard to the condition of the joint by introducing a probe, I enlarged the sinus that led

\* Treatise on the Excision of Diseased Joints, 1831.

most directly towards it sufficiently to admit my finger, with the point of which the head of the bone was felt bare and smooth. The extreme firmness of the surrounding parts prevented a more free examination, but the information thus gained, together with the history of the case, convinced me that a portion of the bone was dead, and detached. I therefore extended the incision already made, finding it necessary to use for this purpose both the knife and cutting-pliers, and then ascertained that the exfoliation lay loose in a bony case. Being unwilling to remove any of the new-formed osseous substance which was destined to take the place of the old bone, I forcibly dilated the edges of the aperture until the shell gave way sufficiently to permit the extraction of the sequestrum, which was then easily effected. After the principal portion here represented was



removed, some small pieces were found lying in the

cavity, which proved to be fragments of the dense plate that had formed the convex surface of the head of the bone. The glenoid cavity of the scapula was divested of cartilage, but covered with a smooth firm velvet-like lining of granulation. Recovery was delayed by unhealthy action of the sore, which assumed a phagedenic, and afterwards a sloughing, character, but was so far completed on the 7th of September, that the boy returned home with an arm not perceptibly shortened, and, though still stiff at the shoulder, nearly as useful as ever. (He has grown up to be a strong active man.)

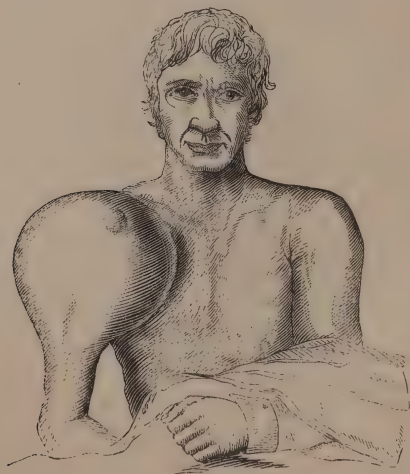
The only circumstance in Mr White's case, which occasioned any doubts of its being an instance of necrosis, was the appearance of the portion of bone removed by him, as it did not present the convex shape of the head of the humerus, and from the diminution of its bulk as well as rough surface, had certainly a carious look. But the case just related was unquestionably one of necrosis, and yet the exfoliation exhibited precisely the same appearance. This circumstance, therefore, can no longer be regarded as any objection to the opinion in question, and may, perhaps, be accounted for, by the stronger vital power of the cancellated texture enabling it to resist the inflammation which proved fatal to the neighbouring bone, and leading to its destruction by absorption instead of mortification.

## ARTICLE X.

AMPUTATION AT THE SHOULDER JOINT FOR THE  
REMOVAL OF AN OSTEO-SARCOMATUS TUMOUR.

[FOURTEENTH REPORT OF SURGICAL CASES. EDINBURGH MEDICAL AND  
SURGICAL JOURNAL, 1836.]

*Fibro-cartilaginous Tumour of the Humerus—Removal together with the arm and part of the scapula and clavicle — Recovery.*—David Dand, aged forty-five, from Dundee, was admitted into the Royal Infirmary on the 23d of December, on account of a large tumour of the right shoulder. Some idea of its form and size may be obtained from this representation. It had a





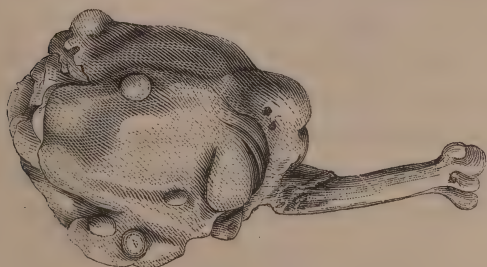
very broad base, which completely filled the axilla, and seemed to grow out from the side of the thorax. The shoulder joint did not admit of any motion, but the arm moved freely along with the scapula. The head of the humerus seemed to be the centre of the swelling, which extended from it in every direction—terminating about half-way from the elbow—and approaching within two inches of the sternum. The clavicle and spine of the scapula could be traced nearly, but not quite to their junction. The consistence of the tumour was extremely firm, feeling in some parts as if it were composed of bone, and in others of fibro-cartilage. The surface appeared in general pretty equal, but when examined more carefully, was found to be irregularly nodulated. The colour of the integuments was not altered. The patient stated that, about six years ago, he began to feel pain occasionally in the shoulder, and six months afterwards, first observed on the fore part of the shoulder a swelling, which was firm, and appeared to be seated on the bone. The tumour gradually increased until August 1833, when he sustained a fracture of the affected humerus from falling on his side. The bone was broken about the middle, and united without any displacement. But the morbid growth advanced more rapidly after this injury—and his uneasy sensations kept pace with its progress. He said that what chiefly distressed him latterly was a feeling of weight and oppression, which never ceased—and was particularly severe during the night. He had no other complaint, and seemed to be sound in all other respects.

As the tumour had evidently originated from the humerus, there appeared good ground to believe that the other bones in its neighbourhood, though perhaps adhering or absorbed in consequence of its pressure, had not taken on the same diseased action—since the fibro-cartilaginous growth, of which this tumour evidently consisted, is never known to spread its roots beyond the bone in which it originates. Several of the metacarpal and digital bones are not unfrequently affected together by such swellings; but in these cases they commence independently, and do not *spread* from one to the other. I therefore concluded that Dand's tumour required for its complete extirpation, nothing more than the removal of the humerus, and that, if it should be necessary to take away a part of any other bone, it would be merely to facilitate the separation of the adhesions, which had formed between the surface of the tumour, and the parts on which it rested. It seemed probable that on this account the glenoid cavity of the scapula, the coracoid and acromion processes, and the acromial extremity of the clavicle, might require to be taken away, but in doing so there did not seem reason to anticipate much difficulty or risk of bad consequences. The removal of the tumour was accordingly recommended to the patient, and gladly acceded to by him, as he was not only suffering great distress, but had been rendered quite unable to support his family.

The operation was performed on the 5th of January. I commenced by making a semilunar incision on the inner side of the tumour, with its convexity forwards, beginning over the acromion process, and terminating

at the lower margin of the axilla. The axillary artery was thus brought into view, and tied. I then made a similar incision on the outer side of the tumour, joining the former one, and proceeded to divide the muscles, which were greatly expanded, and apparently much altered in their texture, being of a greyish-yellow colour, and of a consistence not unlike that of some malignant growths. These coverings having been divided, the tumour came distinctly into view. With the cutting-pliers, I easily cut through the acromion process and clavicle, and then depressing the arm separated its remaining attachments. It now appeared that a fibrous ankylosis had existed between the glenoid cavity and the tumour, which had a cup-like form, and embraced the cavity on all sides. I therefore sawed through the neck of the scapula, and removed a portion of the bone, including the coracoid process, which could not have proved in any way useful, and might have delayed recovery. The edges of the wound came very well together. The patient never had any symptom of disturbance, and was dismissed quite well on the 13th of February.

The tumour weighed twelve pounds, and is here



represented. I macerated it in expectation of obtaining a specimen of foliated or acicular exostosis similar to some others in my possession, but was disappointed, owing to the large proportion which the fibro-cartilaginous growth bore to the expanded bone, which consequently could not be preserved in one mass, and fell into pieces when deprived of the support it had received from the softer substance.

I heard lately of the patient, who continues well. The most disconcerting circumstance encountered in the operation was the alteration of the appearance and consistence of the muscles, which were well calculated to excite doubts as to the extent of the disease. The execution of it, though laborious and formidable, was not difficult, with the exception of the ligature of the axillary artery, which was very tense, owing to its being stretched over the tumour, and was not easily disengaged from the neighbouring parts.

I have at present under my care, a gentleman from Yorkshire, who came here to have a tumour of the scapula removed, and I found more difficulty in doing this apparently easy operation, which required merely that the part of the bone below the spine should be taken away, than in performing the seemingly more arduous one which has just been described. It is difficult, indeed, for any person who has not witnessed the excision of the scapula to conceive the embarrassment which proceeds from the quantity of muscular substance that requires division, and the number as well as size of the deep-seated blood-vessels.

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This case appears not unworthy of being reprinted on two grounds. In the first place, the tumour, so far as I know, was the largest on record removed from the same situation. In the second volume of the Transactions of the London Medico-Chirurgical Society, there is recorded an amputation at the shoulder, performed by Sir A. Cooper, for the removal of one weighing eleven pounds, which impeded but did not altogether prevent motion of the joint; while in Dand's case the growth weighed twelve pounds, and, being confined to the upper half of the bone, ascended so high as to envelope the glenoid cavity and adhere to it, thus effacing all recognizable distinction between the clavicle, scapula, and humerus.

In the second place, this case affords an instructive illustration of the principle, that ~~new~~ malignant growths from the osseous texture do not extend their roots beyond the bone in which they originate, provided it is limited by articular cartilage. It was the confidence I placed in this well-ascertained fact that induced me to undertake the operation, notwithstanding the discouraging circumstances that have been mentioned.



## ARTICLE XI.

## ON AMPUTATION AT THE ANKLE JOINT.

## FIRST NOTICE.

[EXTRACTED FROM THE LOND. AND EDIN. MONTHLY JOURNAL OF MEDICAL  
SCIENCE FOR FEBRUARY 1843.]

JOHN WOOD, aged sixteen, recommended by Mr Aitchison of Dunbar, was admitted into the Royal Infirmary on the 8th of September 1842, suffering from disease of the foot, which had suppurated and ulcerated, in consequence of a twist he had given it in walking about twelve months before. On the instep, which was very much swollen, there were two openings that permitted a probe to enter freely into the substance of the tarsal bones, and more particularly the astragalus and os calcis. In these circumstances, it was plain that the patient, already much emaciated and reduced in strength, had no chance of recovery except from amputation.

As the disease extended beyond the limits of Chopart's operation, it would have been necessary, in accordance with ordinary practice, to remove the leg

below the knee, but as the ankle joint seemed to be sound, I resolved to perform disarticulation there. With this view, I cut across the integuments of the instep in a curved direction, with the convexity towards the toes, and then across the sole of the foot, so that the incisions were nearly opposite to each other. The flaps thus formed were next separated from their subjacent connexions, which was easily effected, except at the heel, where the firmness of texture occasioned a little difficulty. The disarticulation being then readily completed, the malleolar projections were removed by means of cutting pliers.

The patient suffered no constitutional disturbance or any alarming symptom after the operation, but recovered slowly, as was to be expected, from his general weakness, and the unhealthy state of the soft parts composing the stump. A small slough separated from the edge of the lower flap, in which, as well as the upper one, I found it necessary, during the healing process, to make a counter opening for the free discharge of matter. He was dismissed on the 2d of December, and I learn from Mr Aitchison that he continues quite well. The wounds are soundly healed; and any degree of pressure can be born by the stump, which has a round form well suited for the adaptation of a boot or artificial foot, and is strongly protected from external injury by its thick integuments.

The result of this case is very encouraging to the performance of amputation at the ankle joint—an operation of greater importance than at first sight may appear, since, if found to be practicable with

safety and success, it should in a great measure supersede amputation of the leg below the knee. The circumstances requiring the last-mentioned operation seldom affect the leg itself, because, if so seriously injured or diseased as to require amputation, it must almost always be removed above the knee. But while compound fractures and malignant tumours of the leg are thus in general subjects for amputation of the thigh, diseases and injuries of the foot have too frequently led to amputation of the leg. Modern surgery, no doubt, has circumscribed this field for the operation, by introducing partial amputations of the foot; but there still remain cases of no rare occurrence, which are held to demand its performance.

When caries attacks the metatarsal articulations of the toes, it is usually confined to a single joint, that of the great toe being the one by far most frequently affected; and Mr Liston's happy employment of straight cutting pliers, instead of the variously formed saws previously in use, for dividing the bones, has rendered removal of the disease from this situation so easy, that the old practice of amputating the leg on such occasions seems hardly credible. If, again, the caries be seated at the other or proximal extremity of the metatarsus, it is sure to engage also the adjoining tarsal bone or bones, and therefore the operation suggested by Mr Hey of Leeds, which was to disarticulate the metatarsus from the tarsus, is not applicable. In many cases, however, as only one of the tarsal bones is engaged, it may be taken away with the corresponding part of the metatarsus, so as to render the foot merely narrower without diminishing

its length. Thus the first metatarsal is removed along with the internal cuneiform bone, and the os cuboides with the two metatarsal bones articulated to it. But the operation of Chopart, which leaves only the astragalus and os calcis, is the most valuable of all partial amputations, as it commands the largest portion of the foot requiring removal for disease or injury, and at the same time preserves a support for the patient not less useful than that which is afforded by the whole of the tarsus. Its introduction was long opposed on the ground that the extensor muscles of the ankle acting through the tendo achillis, when no longer antagonised, would draw up the heel and point the cicatrix to the ground. I performed this operation in 1829,\* so far as I know for the first time in Edinburgh (Great Britain?), and have frequently done so since, with the most satisfactory result, no inconvenience having ever been experienced from the source just mentioned, as the cut extremities of the tendons on the fore part of the joint speedily acquired new attachments, enabling them to counteract the extensive power.

But when caries affects the astragalus, or os calcis, or, as very frequently happens, is seated in the articular surface between these bones, no form of partial amputation can be of any avail, and attempts to cut out the diseased bone generally prove unsuccessful. In cases where the tuberosity of the os calcis is alone affected, excision may be executed completely

\* Quarterly Report of the Edinburgh Surgical Hospital. Edin. Med. and Surg. Journal, 1842.

and certainly ; and it is sometimes, though rarely, possible to extirpate the disease, even when it extends to the articulation, either directly by gouging out the carious part, or by making a perforation through it across the foot, and passing a seton, which may be made the vehicle of suitable applications, such as the red oxide of mercury, the mineral acids, or a saturated solution of the nitrate of mercury. When these means fail, or are abstained from, in despair of their efficiency, amputation of the leg is the ordinary resource, and the same measure is of course considered necessary for similar disease of the ankle joint. In the case of compound dislocation of the astragalus, with or without fracture of the malleoli, it is deemed proper, in the first instance, to give the patient a chance of retaining his limb:—unless his habit of body, or the circumstances in which he is placed, should be unfavourable for his recovery, when prudence is thought to require amputation of the leg.

It thus appears that compound dislocation of the astragalus, and caries of this bone and of its adjoining articulating surfaces, are the principal cases for amputation of the leg, and that consequently this operation may usually be superseded by amputation at the ankle joint. It may be objected that, when the joint itself is diseased, entire removal of the articulation must be requisite. But in what is commonly called disease of the ankle, the joint between the astragalus and os calcis is affected much more frequently than that between the astragalus and bones of the leg ; and even when the latter condition really exists, it would be easy to remove all of the bone that is essential for



recovery, by sawing off a slice from the articulating extremities of the tibia and fibula, as the caries penetrates to no great depth in the cancellated texture.

The advantages promised by amputation at the ankle joint, instead of the operation near the knee, are—*1st*, That the risk of life will be smaller; *2d*, That a more comfortable stump will be afforded; and, *3d*, That the limb will be more seemly and useful for support and progressive motion.

The risk of life must be less, because the parts removed are not nearly so extensive as when the leg is amputated, hardly exceeding, indeed, those concerned in Chopart's operation; because there is less room for hæmorrhage, either immediate or secondary, owing to the smaller size of the vessels cut, which are merely the branches of the posterior tibial, and the anterior tibial artery, very near its termination; and because the cavities of cylindrical bones not being opened, the danger of exfoliation from the dense osseous texture, and of inflammation in the medullary veins, is avoided. The stump will be more comfortable, because it is formed of parts peculiarly well calculated to protect the bone from injury, and not disposed to contract like the muscular tissue; because the cut extremities of the nerves being smaller, will be less apt to enlarge and become the seat of uneasy sensations; and because the absence of exfoliation insures complete union of the integuments over the bone. And the limb will be more useful, as well as seemly, from full play being afforded to the movements of the knee joint, without the embarrassment of an imperfect stump.

On these grounds, I think amputation of the ankle joint may be advantageously introduced into the practice of surgery. I regret having cut off many limbs that might have been saved by it, and shall be glad if what has been here said in its favour encourages others to its performance.

[SECOND NOTICE FROM THE EDINBURGH MONTHLY JOURNAL, APRIL 1843.]

IN the observations which I lately offered, with the view of recommending disarticulation at the ankle joint instead of amputation of the leg, it was stated that even in cases where the joint itself was diseased, "it would be easy to remove all of the bone essential for recovery, by sawing off a slice from the articulating extremities of the tibia and fibula, as the caries penetrates to no great depth in the cancellated texture." Soon after this opinion was expressed, I met with an opportunity of testing its accuracy, and am happy to say that the result promises to realize my most sanguine expectations.

Dr W., a medical gentleman about twenty-five years of age, after suffering from general rheumatism, was twelve months ago attacked with severe pain in the left ankle, accompanied by swelling and inability of using the limb. Various remedies were used without much benefit. An abscess opened in the course of the summer, and continued to discharge from a sinus between the ankle and heel. Six weeks ago, I saw him with Mr Goodsir. He was much reduced in strength, and greatly emaciated, obtaining no rest

except through the use of opiates, and evidently sinking under his protracted sufferings.

In these circumstances, amputation appeared to offer the only hope of relief, and even this measure, if carried into effect at the usual part below the knee, threatened no small danger in the patient's weak and irritable state. I proposed disarticulation; and, meeting with no objection, performed it as described in my former paper. The articulating surfaces of the joint being every where divested of cartilage, rough, and carious; instead of removing the malleolar projections separately, I exposed the bone sufficiently to saw off both together, with a thin lamina of the tibia connecting them. This was effected with the greatest facility, and left a perfect sound surface. No constitutional disturbance followed—the patient improved in strength as well as appearance every day after the operation, and the healing process proceeded most satisfactorily. There is now merely a slight watery discharge from the cavity of the flap. This happened in the former case, and required a counter opening for its discharge. But a counter opening has been rendered unnecessary on the present occasion, by an opening through the integuments of the heel, which was found unavoidable in dissecting them from the bone, owing to their thinness and firm adhesion. The drain thus afforded has proved so useful by permitting a free escape to the discharge, and allowing the edges of the flaps to unite throughout their whole extent, that I think its intentional establishment would be advantageous.

[THIRD NOTICE FROM THE EDINBURGH MONTHLY JOURNAL, AUGUST 1844.]

It may seem a startling, but it is nevertheless a true statement, that amputation at the ankle joint, with hardly any exceptions, may, and ought to supersede amputation of the leg below the knee. In order to establish this position, it is necessary to show, in the first place, that the stump, which results from the former operation, is fit for the duties required of it; and, secondly, that the patient may, under the various circumstances concerned, be relieved as effectually in the one way as the other.

The idea of amputating at the ankle joint is not new, the operation having been performed on the Continent by different surgeons before I thought of it; and it would probably ere now have become generally adopted, but for the doubt that was entertained as to the ends of the bones being sufficiently covered to afford the patient a comfortable and useful support for the limb. For my own part, when I read of dissecting flaps of skin from the instep, or sides of the foot, I felt so much distrust in the protection that could thus be effected, against the injurious effects of pressure on a part so exposed to it, that I had no desire to try the experiment. But it occurred to me, that by performing the operation in a different way, all such objections might be obviated. This was to save a flap from the sole of the foot and thick integuments of the heel, by making a transverse incision,

and dissecting these parts from the os calcis, so that the dense textures provided by nature for supporting the weight of the body, might be still employed for the same purpose. Two trials of this operation having proved satisfactory, I communicated them to the profession, and am glad to find that not only my colleagues in the hospital here, but also practitioners in other places, have already acted upon this recommendation. The additional experience of my own practice now enables me to suggest some improvements in the mode of procedure—point out an error to be avoided—and verify the expectation formerly expressed as to amputation of the leg being hardly ever required.

The best instrument for performing the operation is a large bistoury, or small amputating knife with a blade about four inches long. There is no occasion for a tourniquet, as the assistant has complete command of the vessels by grasping the ankle. In my first operations, the flap was made unnecessarily long; and I feel confident that the following directions may be trusted for exactly determining its proper extent. The incisions across the instep and sole of the foot should be curved, with the convexity forwards, and exactly opposite each other. A line drawn round the foot, mid-way between the head of the fifth metatarsal bone and the malleolus externus, will show their extent anteriorly, and they should meet a little way further back, opposite the malleolar projections of the tibia and fibula. Care should be taken to avoid cutting the posterior tibial artery before it divides into the plantar branches, as in two cases where I



did so, there was partial sloughing of the flap. If the ankle joint is sound, the malleolar processes should be removed by cutting pliers; but if the articulating surfaces of the tibia and fibula be diseased, a thin slice of these bones should be sawn off. The edges of the wound should be stitched together and lightly dressed. When the cure is completed, the stump has a bulbous shape, conical in form on the inferior surface, and having for its apex, or central point of pressure, the thick integument which covered the heel.

In proceeding to consider the circumstances in which this operation may be performed, it seems worthy of notice, that, until a recent period, amputation of the leg was in this country generally resorted to for the removal of diseased bone, when the part affected extended upwards beyond the metatarsus. The operation of Chopart might frequently have accomplished all that was requisite, but unfortunately suffered from a prejudice which opposed its adoption. This was, that the extensors of the heel, being deprived of antagonizing action, would point the stump downwards, so as to render it useless as a support for the body. In 1829, for reasons elsewhere stated,\* though there was no precedent for its performance in Edinburgh, I ventured upon this partial amputation of the foot, with perfect success, and without the slightest inconvenience of the kind anticipated. Encouraged by this result, I resolved to adopt the operation: and before long performed it six times with entire satisfaction. Since that time the operation has been esta-

\* Edinburgh Medical and Surgical Journal, October 1829.

blished here, and regularly practised in cases admitting of its application.

Although the introduction of Chopart's operation considerably abridged the field for amputating the leg, there were still two situations in which caries frequently occurs, where it was beyond the reach of any partial removal of the foot. These were the joint between the astragalus and os calcis, and the ankle joint itself. In the former of these situations, the diseased bone is so near the fibular side of the heel, that it is apt to seem within reach of the gouge or other means of extirpation ; and attempts have often been made to effect this, but seldom if ever with success, owing to the caries extending along the complicated articulating surfaces of the bones affected. I have succeeded in such a case, by making a fair breach through the foot from side to side, and passing a thick seton, which could be made the vehicle of red precipitate and other escharotics ; but even this treatment cannot be depended upon, and its failure, in a case where I had ventured to indulge hopes of success, led me to think of contriving a method of amputating at the ankle joint which might afford relief under such circumstances, and afford the patient a comfortable stump. In the case of John Wood, formerly related,\* the disease was thus situated, between the astragalus and os calcis. Soon after that case had terminated favourably, I met with another related in the same paper, where the ankle joint itself was affected ; and did not hesitate to repeat the oper-

\* Monthly Journal, February 1843.

ation. The gentleman who was the subject of it, though long in very indifferent health from other causes, now walks with ease and comfort.

Compound dislocation of the ankle joint, either with or without that curious displacement of the astragalus, which results from falling with great force on the heel, was formerly held to require amputation of the leg. The authority of Sir A. Cooper's experience encouraged attempts to preserve the limb in such cases ; and in private practice both forms of the injury are now frequently conducted to a successful issue, though in general through a protracted process of recovery. But it must be admitted, that many lives have been lost, especially in hospitals, from trying to retain the limb. In the Royal Infirmary, I find that of thirteen patients who had suffered compound dislocation of the ankle, and were not subjected to amputation, only two recovered ; and even in the event of recovery, the foot generally remains in such a state of stiffness, weakness, and sensibility of external impressions, as to be rather an encumbrance than a support to the patient. Now, all this danger, tedious confinement, and permanent discomfort might be obviated by amputating the foot in the first instance. So long as the only alternatives were an attempt to preserve the limb, and amputation of the leg, there was a strong inducement to abstain from operating. But if the patient's safety and speedy recovery may be ensured by taking away merely that part of the limb which, in the circumstances, can be of little value either as to use or ornament, while at the same time a stump is produced in

all respects preferable to a shattered, stiff, irritable foot—I think there should be little hesitation in resorting to amputation at the ankle joint under the circumstances in question. I would certainly have done so in the following case, had I not been in the country on the day of the patient's admission.

CASE I.—John Cameron, aged fifty-four, was admitted on the 11th November, having on the morning of that day fallen from a height of about twenty feet into the hollow of a gasometer. There was a large rent in the instep of his right foot, through which the articulating surface of the astragalus protruded. It was replaced without any difficulty, and the edges of the wound were brought together. He did very well for a few days, but then became feverish, and complained of pain in the limb, which had become much swelled. Incisions were made with the effect of discharging matter and affording relief. He continued pretty well until the 25th, when he had a rigor followed by increase of fever. On the 31st he had another rigor, and his pulse, which had previously ranged from ninety to a hundred, increased to a hundred and twenty. On the 2d December, as a forlorn hope, I amputated the foot at the ankle joint. As the malleolus internus was fractured, and the articulating surfaces of the tibia and fibula divested of cartilage, I sawed off a slice of both bones. The patient improved daily after the operation, and though recovery was delayed by the unhealthy state of the leg, in which diffused suppuration repeatedly took place, the stump had cicatrized completely on the 15th January.



All who witnessed this case were persuaded that amputation of the leg would have proved fatal if performed at the time the foot was removed.

When the anterior part of the foot is destroyed by violence or exposure to cold, the remaining soft parts may be employed in different ways to afford a covering for the bones. It was for such occasions that Chopart contrived his operation, which, from its proximity to the ankle, has hitherto been considered the last resource, short of amputating the leg. This severe measure would have been deemed necessary in the following case, according to the established rules of practice.

CASE II.—James Sutherland, aged twenty-five, from Shetland, was admitted on the 25th of September. He stated that four months before, in consequence of exposure to cold, his left foot suffered from mortification; nearly the whole of it had separated, so that only the astragalus and os calcis, with the integuments covering them, remained. The anterior articulating surfaces of these bones were quite denuded, and it was evident that the formation of a cicatrix over them was not to be expected through any length of time or attention in treatment. But as the soft parts, though not more than sufficient for the ankle joint amputation, seemed adequate for the purpose, I resolved to attempt the patient's relief in this way.

I performed the operation on the 3d October, taking away no part of the integument except what was requisite to give the flaps a proper form. The wound healed by the first intention, and before the end of the fourth week the patient was able to walk



through the wards with a common shoe, so that the defect of his limb could hardly be noticed.

In describing the operation, I have said that care must be taken to avoid cutting the posterior tibial artery before it divides into the plantar branches; and I may now explain more particularly the ground on which this advice is founded.

CASE III.—Elizabeth Wilson, aged seven, from Dalkeith, recommended by Dr Hunter, was admitted on the 19th of February, on account of disease in her left ankle. It had become swelled and painful about sixteen months before, without any known reason. Matter speedily formed, and was discharged spontaneously by several openings, which did not afterwards heal. The foot was much enlarged, stiff, and shapeless; and two sinuses allowed a probe to pass into carious bone.

On the 21st, I proceeded to amputate at the ankle joint, but finding that ankylosis had taken place between the articulating surfaces, I exposed the extremities of the tibia and fibula, and sawed them through, without previously removing the foot as usual. In tying the vessels, it appeared that the posterior tibial artery had been divided before its division into the plantar branches, so that one ligature sufficed in place of two. The stump looked remarkably well, and the result of the operation was expected to prove very favourable. It was therefore with much surprise, and no small disappointment, that in the course of a few days I saw the flap had sloughed through fully a half of its extent. Recovery was

consequently delayed much beyond the ordinary period, and the patient did not leave the hospital until the 31st of March. The stump at length cicatrized by contraction of the integuments, and though not so full and cushion-like as usual, became perfectly serviceable and comfortable.

I attributed the sloughing in this case to the undue pressure of a bandage; and having occasion soon afterwards to perform the operation on a patient in Minto House, intentionally divided the posterior tibial before its division, in order to obtain the same facility in tying the vessel as on the last occasion. To my surprise and concern, the flap again sloughed to the same extent as in the case just related, and as great attention had been paid to dressing the stump, I could not refer this effect to the cause formerly supposed. But as, on both occasions, the artery had been cut before its division, while in all the other cases it had been left entire, and as the flap, being deprived of nourishment from most of its ordinary sources, must be supplied with blood only through the successive anastomoses of small vessels, I concluded that this deviation from usual practice had led to the mischief in question, and I resolved to avoid it for the future.

CASE IV.—Robert Craig, aged ten, from Dunbar, recommended by Mr Turnbull, was admitted on the 3d of June, on account of disease in his right foot. It was stated that three months before, after severe rigors, inflammation had commenced, and been speedily followed by the formation of matter. A

succession of abscesses then formed, and gave rise to a number of sinuses opening in different parts of the instep and sides of the foot, and allowing a probe to enter carious bone. The general health had latterly been much impaired.

I amputated the foot on the 5th, taking care to avoid cutting the posterior tibial artery. The wound healed chiefly by the first intention, and the boy is already almost quite well.

It has now been ascertained that amputation at the ankle joint may be performed so as to afford a stump in every respect convenient and comfortable, retain the full use of the knee joint, and enable the patient to walk with perfect freedom. It has also been shown that by means of this operation caries of the upper range of the tarsus, of the joint between the os calcis and astragalus, and of the ankle joint itself, may be removed; while compound dislocation of the ankle, and destruction of the foot beyond the extent admitting of Chopart's operation, may also be remedied by it. But what other occasion besides these is there for amputating the leg? Malignant tumours of the tibia and fibula require amputation of the thigh, and compound fractures of the leg, so severe as to demand removal of the limb, hardly admit of the operation being performed below the knee, on account of the soft parts so near the seat of injury being unfit for healing action. The cases, therefore, requiring this operation, must be very few. In my own practice, since adopting amputation at the ankle joint, I have removed only one leg below the knee, under very

peculiar circumstances, which did not permit the milder measure to be adopted.

In conclusion, it may be remarked, that the advantages of amputation at the ankle joint, as compared with amputation of the leg, are not limited to the smaller degree of mutilation and greater utility of the limb; since the operation is also attended with much less danger. This will appear when it is considered, *1st*, How much less the shock must be, from the small extent of parts removed, which is little more than in Chopart's partial section of the foot. *2d*, That the smallness of the arteries divided prevents any risk of serious hemorrhage. *3d*, That from its cancellated texture the bone exposed is not liable to exfoliate. *4th*, That from the medullary canal remaining entire, inflammation of its contents, and also of the veins, is prevented.

In confirmation of these grounds for favourable expectations as to the diminution of danger, I am now able to add the proof of experience, since in fourteen cases where the operation has been performed, eight in my own practice, and six in that of others, there have not occurred any fatal results.

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[FOURTH NOTICE, FROM THE EDINBURGH MONTHLY JOURNAL,  
MAY 1845.]

IN former communications I have endeavoured to establish the general utility of amputation at the ankle, by showing the successful application of this

operation to the relief of different morbid conditions, for which removal of the leg has been hitherto thought necessary. Caries of the astragalus and os calcis, and of the ankle joint itself; destruction of the whole foot, except the heel, through exposure to cold; and compound dislocation of the astragalus, by the effects of external violence, threatening to prove fatal by continued suppuration, have all been remedied in this way. With the same view, I will now relate two cases of a different kind which have lately occurred.

CASE V.—*Erectile tumour of the foot in an infant five months old—Amputation at the ankle—Recovery.*—I was asked by Dr Charles Bell to see this little patient. At the time of birth there was a considerable growth of the erectile character occupying the anterior part of the foot, which did not enlarge much during the first two or three months, but afterwards increased very rapidly, so as at length to destroy all trace of the ordinary form, and convert the foot into an unshapely tumour, of a purple colour. As the integuments of the heel remained sound, it seemed practicable to remove the disease by disarticulation at the ankle joint. And as a very slight extension of the swelling, by preventing this measure, would have left no alternative but amputation of the leg, I advised against further delay, notwithstanding the want of any precedent for performing so serious an operation at an age so early.

On the 15th of January I removed the foot in the usual manner, with exception of not taking away the malleolar processes. The child did not suffer



the slightest constitutional disturbance; and the wound healed almost entirely by the first intention. Mr Goodsir has given me the following account of the tumour:—

“A fine injection of size and vermilion having been thrown into the arteries of the foot, the skin assumed a red tint, except where it was so attenuated as to display the peculiar bluish colour of the subjacent diseased mass.

“It was then cut longitudinally into two portions. A gush of venous blood reduced its size very considerably. By means of a gentle stream of water, the rest of the contained blood was washed out, all pressure being avoided.

“The two halves were then laid in a basin of spirit, and by means of a syringe, that fluid was forced into the diseased mass, so as to distend the whole almost to its original size.

“After having been hardened, fresh longitudinal sections were made, avoiding all pressure, and the structure was examined.

“The *venæ saphenæ*, plantar and posterior tibial veins are much enlarged, and have undergone a peculiar change, which consists of increased bulk of the fibrous fasciculi of their coats; and of longitudinal and oblique foldings of the parietes, due, partly to the fasciculation, partly to actual involution.

“About the centre of the foot, the veins break up into the general cellular arrangement which constitutes the disease; the *saphenæ* forming a sort of central cavity on the dorsum; the plantar a much larger cavity or central areola in the sole of the foot.

“The diseased mass itself consists of areolæ which decrease in size, from the central venous cavities to the surface of the skin, and to the deep limits of the disease: these limits being defined by the internal membrane of the venous system, which is continuous through all the areolæ.

“The diseased mass has not displaced the surrounding textures, but has caused them to disappear before it, as in certain malignant growths and ulcerations, — bone, ligament, muscle, and fat, having equally failed in resisting its progress, the skin alone standing out against its advance, and along with the venous membrane forming the limit of its superficial portion.

“The areolæ of which the mass consists are elongated from the central cavities towards the limits of the disease, being more elongated the nearer they are to the centres. The peculiar form of the areolæ is due to the radiated direction of the bars, and imperfect laminæ which separate them, these being thicker, stronger, more elongated, and more separated from one another around the central cavities, than near the circumference, where they are shorter, finer, and much more numerous.

“The bars and imperfect laminæ consist of fibrous texture exactly resembling that of the tendinous ligaments, and aponeuroses, with numerous germinal centres.

“The bars and laminæ are all covered, and consequently the contained areolæ lined by a fine membrane consisting of tessellated epithelium, and continuous with the lining membrane of the venous system, at

the central cavities, or diseased terminations of the saphenæ and plantar veins.

“In many of the bars and laminae, small arteries are situated, and one of these was traced nearly to the termination of the anterior tibial on the back of the foot. It was not ascertained how the arteries terminated, but it was presumed that they passed by small oblique orifices into the venous areolæ, as the curling arteries of the human placenta pass into the venous areolæ of the decidua.”

CASE VI.—*Ulcer of the Heel with disease of the Os Calcis — Amputation at the Ankle — Recovery.* — Thomas Niven, aged thirty-six, fourteen years ago fell into a coal-pit, and, alighting on the heel of his left foot, sustained a great shock of the whole limb. It ever afterwards felt weak and impaired in sensibility, and also became thinner than the other one. But his principal complaint was a sore on the heel, which allowed a probe to pass into the substance of the bone, and on this account he was admitted into the hospital three years after the injury, when, thinking that the limb might recover its vigour in time, if relieved from the local imperfection, I exposed the tuberosity of the os calcis, and sawed off all the part of it which seemed to be diseased. The wound healed, and he was dismissed with the prospect of being soon quite well.

He returned the 15th of August last, complaining of a sore in the old situation still exposing the bone, and also of another confined to the integument over the trochanter major, which had given him little trouble,

while the former rendered him quite unable to work, or make any exertion for his support. In other respects the limb remained as has been already mentioned, and excited some apprehension that even the complete removal of the local disease would not afford relief. But as the patient was extremely anxious to have any thing done that promised a chance of benefit, I resolved to amputate the foot.

I performed the operation on the 19th of August, carefully preserving the integuments that remained sound on each side of the heel, so as to compensate for the great loss of substance in the sole of the foot, and thus formed two lateral flaps, which met together very well over the ends of the bones, after the malleolar processes, with a thin connecting slice of the tibia, had been sawed off. The wound healed soundly without trouble or delay; the sore near the hip also cicatrised: and the patient was dismissed on the 27th of September.

The two following cases do not present any features materially different from those which have been noticed in former communications, and may therefore be merely mentioned as confirming what has been already stated with regard to the success attending amputation at the ankle for caries,—the morbid condition most frequently requiring the operation, and for which I regret to learn that amputation of the leg is still in use. Prejudice, and established habit, are doubtless great obstacles to improvement, but should not be permitted to maintain what has been proved to be an unnecessary mutilation.

CASE VII.—*Caries of the Astragalus and Os Calcis — Amputation at the Ankle — Recovery.* — Peter Anderson, aged twenty-two, from Forfarshire, was admitted on the 17th of December last, on account of a disease in his foot, which had existed for fifteen months, in consequence of falling from a height upon the heel, and for twelve months had prevented him from following his employment as a mill-wright. I amputated the foot at the ankle on the 15th of January, and he was dismissed with an excellent stump on the 27th of March.

CASE VIII.—*Caries of the Tarsus and Ankle Joint — Amputation at the Ankle — Recovery.* — John Christie, aged fourteen, from Fife, was admitted on the 21st of January, on account of an extensive disease in the bones of his foot, which had existed two years. I amputated the foot at the ankle on the 5th of February; and the patient was dismissed with an excellent stump on the 30th of March.

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[FIFTH NOTICE FROM THE MONTHLY JOURNAL OF MEDICAL SCIENCE.]

IN the number of this journal for last month, I find the following passage extracted from a foreign medical periodical :—

“ A tibio-tarsal amputation was performed some years ago on a young soldier, by Dr Baudens. The patient could walk very well for a year afterwards with an ordinary shoe, attached by two metallic splints. He



walked considerable distances in this manner without fatigue, ascended and descended stairs easily, danced and leaped with agility. This patient afterwards entered the hospital wards of the Hotel des Invalides, where he has remained several months. His stump became excessively painful; the cicatrix re-opened, and ulcerated in many places. Two abscesses, which formed in the tissue of the cicatrix, were opened a few days ago by M. Hutin, and it is probable that the subjacent bones were diseased. The patient experiences great suffering, and eagerly demands another amputation near the knee.

“ This case gives rise to certain questions, of which our readers have to demand an account. First, we must remark, that the indifference with which civil and military surgeons have received the memoir of M. Baudens, is no proof of the non-value of the operation, for it has been performed by Mr Syme of Edinburgh a dozen times with perfect success. It is true, however, that Mr Syme has generally operated on children, and that he has only published the immediate results of the operation. Now the question is, what are the remote consequences? since, in the case of M. Baudens, the cicatrix did not inflame, ulcerate, or re-open, for more than a year after the operation. It becomes the more important to know the actual state of Mr Syme's cases, as it might enable us to decide, whether the bad condition of the cicatrix in the patient now at Les Invalides, depends on a constitutional disease (as we presume is the case), or on the form of the flaps, or of the stump. We should remember, however, that in the operation of

M. Baudens, the head of the malleolus was sawn through after the disarticulation, whilst Mr Syme preserves the malleolus intact. We must say, that until new facts enlighten us on the subject, and notwithstanding the great aversion that the civil and military surgeons of Paris experience in adopting the tibio-tarsal operation, we persist in believing it advantageous in many cases. We amputate at the articulation of the wrist, why then hesitate at the same point in the inferior extremity?"\*

With reference to this statement, I beg to mention,—1. That I have operated in more nearly two than one dozen of cases with perfect success,—2. That most of the patients have been adults,—3. That I have in no instance, except that of the infant (p. 133), "preserved the malleolus intact;" and have always removed the whole articulating surface, except once or twice, when I detached the malleolar processes by means of cutting pliers; having on all other occasions sawn off a thin slice from the tibia, connecting the projections of bone at each side—and, 4. That the following letters relative to the two cases, which were first subjected to the operation, and gave rise to my original papers, will, I hope, be considered satisfactory evidence as to the "remote consequences." In the first of these cases, the disease being seated between the astragalus and os calcis, only the malleolar parts of the articular surface of the ankle were removed. In the second,

\* Annales de Thérapeutiques, Mars 1846.

as the ankle joint itself was extensively carious, the whole articulating surface was removed by the saw.

As to the mode of performing the operation, I have nothing to say in addition to what has been already stated, except that I find a flap sufficiently large for the purpose, is obtained by cutting from the centre of one malleolus to that of the other, right across the sole of the foot ; the dissection from the os calcis is thus facilitated, and the risk of sloughing lessened, if not entirely prevented.

From THOMAS AITCHISON, Esq., Surgeon, Dunbar,  
to Mr SYME.

*Dunbar, 4th June 1846.*

MY DEAR SIR,—It gave me great pleasure to hear, by yours of the 2d instant, that the boy Fargie's case is likely to terminate so satisfactorily.

I sent for the boy Wood, whose life was spared by a similar operation, executed by you two or three years ago (September 1842, age sixteen). I examined most carefully the *stump*, which was all sound. He had had a renewal of the false foot since he had seen you. He told me he suffered no inconvenience from the stump, or the slightest tenderness. He has become a country tailor, and has often ten and fifteen miles a-day to go to his work ; still he feels no *discomfort*. He says, he, with a few of his young comrades, ran off to see the operations of the North British Railway at Penmanshiel tunnel, and must have walked fully thirty to thirty-five miles, without feeling his amputated limb.

You may rely upon it, nothing can be more satisfactory than this case of the boy Wood ; and if Fargie's and all similar cases prove, under your hands, as successful, amputation at the ankle joint, and its effects, will prove the greatest blessing to the human race, especially those unfortunates so afflicted.—I am, my dear Sir, yours most faithfully.

THOS. AITCHISON.

The young man Fargie, alluded to by Mr Aitchison, had suffered from caries of the tarsus for fourteen years. He had the foot amputated, and left the hospital, restored to health, and with a sound stump, six weeks after the operation.

Dr —— to Mr SYME.

*Edinburgh, 9th June 1846.*

DEAR SIR,—You will remember that I lost my foot in January 1843. The stump healed rapidly, and in six weeks had all closed, except one small aperture, from which a slight watery discharge continued to come till the month of June, when it suddenly ceased, and complete cicatrization occurred. Since that period, I have experienced no pain or uneasy sensation of any kind, in the stump, nor any tenderness, making standing or walking irksome or unpleasant. I have very rarely experienced the feeling of the lost foot being still part of the body and the seat of pain, which is so common a complaint among those who have been deprived of limbs. For the last two years, I am not aware that I have known this

sensation at all ; if I have, it has made no impression on my memory. I can lean the weight of my body on the naked stump without inconvenience ; and, with a single stocking over it, am in the habit of walking through the house when my boot is not at hand.

The artificial foot I wear, within an ordinary half boot, is made of light wood, with a spring across the part corresponding to the roots of the toes. This spring, however, is of no use, as the rigidity of the boot enclosing it prevents its acting. The foot might as well be made of one piece of wood. At the heel it is hollowed into a concavity, corresponding to the shape of the stump, but rising up before and behind into two prolongations, which, seen in section, would resemble the horns of a crescent. The foot is cased in shamois leather, which is carried up from the borders of the concavity, and cut into the shape of the upper part of a lady's cloth boot. Like it, also, it is laced up the inner side, and has a tongue ; the latter is made of thick soft leather, and is of much service in securing the fitting of the foot. There are no straps or buckles, or steel supports of any kind, nor are they needed. From the bulbous form of the stump, and its circumference being considerably greater than that of the leg above it, the lacing of the upper leather completely suffices to hold the artificial foot on. It would be impossible, indeed, to pull it off without loosening the lace or tearing the leather.

The artificial foot, as originally furnished, was thickly padded ; but I found the padding so apt to shift, and so liable to become uncomfortable from saturation with moisture, that I had it all removed.



It is much more convenient to pad the stump, by covering it with two or more worsted or shamoy leather stockings, which can be changed at pleasure. I use a stick in walking; but, except on rough causeways or very uneven ground, it is unnecessary, neither is it requisite in ascending or descending stairs.

The results of an inflammatory attack of the lungs make me a bad walker, nor have I ever ascertained how long a pedestrian journey I could achieve; but I have stood for six hours (not consecutively) daily, for months together, without any inconvenience, and I wear the artificial foot, without intermission, from morning till bed-time.

Very sincerely,                    ——— ———

This gentleman was in such a state of weakness and illness at the time of the operation, that, in my opinion, he would not have had the slightest chance of recovery from amputation of the leg.

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Though at the expense of some repetition and want of arrangement, I have given these different notices of amputation at the ankle as they originally appeared, instead of digesting them into a more methodical form, that the reader may see how I was led to adopt and place confidence in the operation.

The favourable anticipations which my first trials led me to entertain, have been more than realized, and I am happy to find that the prejudice, which is always opposed to any alteration of established prac-

tice, is rapidly giving way to the force of conviction, founded on experience. In many metropolitan and provincial hospitals of all the three kingdoms, and frequently also in private practice, amputation at the ankle has been practised with the most satisfactory effect. On the continent this operation has met with a not less favourable reception, and is especially indebted to the testimony so honourably bestowed on it in the distinguished school of Heidelberg, where Dr Chelius, jun., has made amputation at the ankle the subject of his practical dissertation,\* and dedicated it to me, in expression of his satisfaction with what he had seen done in Edinburgh, and successfully repeated in the hospital of his respected father.

Little further remains to be said upon the subject, and the only point which seems to require any notice, regards the proper extent of flap, together with the mode of detaching it, as it is this part of the process that seems to constitute the only stumbling-block in the way of its general adoption. Indeed, the difficulty attending the dissection of a flap from the heel, has been found so great by some operators, as to induce them to try other modes of obtaining a covering for the bones, while the dread of mortification has suggested to others the formation of lateral flaps. Now it is certainly very desirable that the thick integuments of the heel should be preserved entire, to form a cushion for the stump; and I am quite sure that the operation for accomplishing this, admits of being performed so as to avoid any mechanical difficulty which may

\* De Amputatione in Articulo Pedis. Heidelberg, 1846.

not be readily surmounted, and also any risk of sloughing.

In my earlier operations, I made the flap unnecessarily long, and in consequence suffered two inconveniences,—in the first place, from difficulty in executing the dissection,—and secondly, from the occurrence of sloughing in the event of the posterior tibial artery being divided above its division into the plantar branches. Succeeding experience taught me that a much smaller extent of flap than had originally been considered necessary was sufficient for the purpose, and that hence the operation could not only be simplified in performance, but increased in safety from bad effects.

I am now able to state precisely the limits of incision which will be found to render the practice no less easy than secure.

The foot being placed at a right angle to the leg, a line drawn from the centre of one malleolus to that of the other, directly across the sole of the foot, will shew the proper extent of the posterior flap. The knife should be entered close up to the fibular malleolus, and carried to a point on the same level of the opposite side, which will be a little below the tibial malleolus. The anterior incision should join the two points just mentioned at an angle of  $45^{\circ}$ , to the sole of the foot, and long axis of the leg. In dissecting the posterior flap, the operator should place the fingers of his left hand upon the heel, while the thumb rests upon the edge of the integuments, and then cut between the nail of the thumb and tuberosity of the os calcis, so as to avoid lacerating the soft parts

which he, at the same time, gently but steadily presses back until he exposes and divides the tendo achillis. The foot should be disarticulated before the malleolar projections are removed, which it is always proper to do, and which may be most easily effected by passing a knife round the exposed extremities of the bones, and then sawing off a thin slice of the tibia connecting the two processes.

## ARTICLE XII.

## ON AMPUTATION OF THE THIGH.

[FROM THE EDINBURGH MONTHLY JOURNAL OF MEDICAL SCIENCE, 1846.]

PREVIOUSLY to 1822, amputation of the thigh had always been performed in Edinburgh by circular incision. Having in that year found the operation by flap regularly taught in Paris as a substitute for the ordinary method—and having witnessed its performance in the practice of Mr Liston—I wrote a paper with the view of recommending this plan, and for many years afterwards inculcated it in my lectures as, on all occasions, preferable to the other.\* In the Royal Infirmary, where all the attending surgeons have been the pupils of Mr Liston or myself, the circular operation was completely abandoned; and the influence of this example, together with the written as well as oral instruction connected with it, has produced the effects that might be expected here and elsewhere.

\* Edinburgh Medical and Surgical Journal, 1823—p. 152.



Notwithstanding the share I thus took in introducing the flap operation, and the confident persuasion of its superiority formerly entertained, I have long felt occasion to point out some serious inconveniences apt to attend its performance; and I am now satisfied that there are circumstances in which the circular incision ought to be preferred. If the relative merits of the two methods in question had been discussed with less party or personal feeling, and more practical experience, it is probable that the choice between them would not have proved so exclusive as it has hitherto done. And I will now endeavour to explain the grounds upon which it appears to me that a reasonable selection may be founded.

In favour of the flap operation, it is contended, 1. That the process, from its facility and rapidity of execution, must be less painful to the patient than the circular incision; and also renders it unnecessary to use a tourniquet, as manual compression in the groin may be effectually employed during the short space of time required for its performance; so that the limb may be removed at any part of its extent, and without the inconvenience alleged to result from the pressure of a tourniquet, in regard to ligature of the vessels. 2. That the soft parts may be readily fashioned, so as to afford an ample covering of muscle and integument for the bone. And 3. That the different textures of the stump, being allowed to preserve their natural connexions, are more capable of sound union, than when detached from each other by dissection and retraction. In objection to this method

it is said, 1. That the rapidity of execution is apt to prove hurtful in subjects of defective strength, by producing a shock similar to that of a gun-shot wound. 2. That the vessels being cut obliquely, are secured with difficulty. 3. That the wound is of greater extent than the surface resulting from circular incision. And 4. That though the flaps afford an ample covering for the bone in the first instance, the contraction of their muscular substance gradually withdraws them from it, during the process of healing, so that there is ultimately nothing more than skin, and frequently not even this, to protect the osseous surface. The grounds upon which the circular operation is maintained, are, 1. The greater facility which it affords to ligature of the vessels. 2. The smaller size of wound resulting from it. And 3. The more permanent covering which it affords to the bone.

In subjecting these various arguments on both sides of the question to the test of experience, it may be remarked, that they are not all of equal value; some of them relating to matter of mere convenience, while others regard consequences of the most serious nature. The great questions at issue are, Which operation least endangers the patient's life? and, Which affords the most comfortable stump? Now, every one who has witnessed the flap operation performed extensively and indiscriminately for amputation of the thigh, must have seen a large proportion of deaths, and in the event of recovery, not unfrequently a condition of the stump no less unseemly than inconvenient. Such are the undeniable facts, and their explanation presents little difficulty to

any one who has had sufficient opportunity of observation.

So far as the mere performance, or early consequences of the flap operation, are concerned, nothing can be more satisfactory. The incisions are executed almost instantaneously, and the whole process is completed with a degree of facility, dispatch, and ease to the patient, that presents a remarkable contrast, when compared with the delay and suffering, from complexity of procedure, necessarily attended upon the circular method. The following extract from a letter addressed to me by Mr Robertson, surgeon of the Convict Hospital Ship, Sheerness, affords a good illustration of the impression thus made upon an unprejudiced mind.

“18th August 1824.

“DEAR SIR,—An opportunity having been afforded in this hospital of putting into execution the mode of amputation recommended by you in the seventy-eighth number of the Edinburgh Medical and Surgical Journal, I determined on adopting it. My patient, a lad of sixteen, labouring under an enlargement of the bones of the knee joint, which had resisted repeated local bleeding by leeches and cupping, issues, blisters, embrocations, and moxa, together with several courses of alterative medicine, submitted to the operation on the 2d instant. My assistant, Mr Bayley, having undertaken to command the femoral artery by pressure with his thumb, I followed your directions in every particular, employing neither tourniquet, tenaculum, nor retractor;

and, in comparison with the former mode of amputation, this was the work of a moment, with a great diminution of pain, little or no hemorrhage, and with a surface that enables every vessel to be seen on the instant.      \*      \*      \*      \*

A convict, on whom I had amputated some time ago, stole unnoticed into the ward, and witnessed this operation. He was so struck with the rapidity of the process, and the diminution of pain to the sufferer, that he stopped me on deck to express his surprise at the *unnecessary* pain to which he had been subjected! I quieted his vexation by telling him, that this mode was not then known.—I am, dear sir, &c.,

“ARCHIBALD ROBERTSON.”\*

When the flaps are placed together, it seems as if nothing could prevent their perfect union so as to effect a speedy cure, and afford a comfortable covering to the bone. In some cases these favourable anticipations are fully realised; but though a good many days, and even one or two weeks, may elapse without making manifest the disappointment to be experienced, it much more frequently happens that the soft parts, however ample they may have appeared in the first instance, gradually contract and diminish until care is required to keep their edges in opposition over the bone, which sometimes, notwithstanding every precaution, at length becomes denuded, and presenting itself to view, whether dead or living, pro-

\* Edinburgh Medical and Surgical Journal, 1824—p. 437.

claims the unavoidable misery of a sugar-loaf stump. This distressing result depends upon the vital contractility of the muscular tissue, which continuing in operation so long as the cut surface is not prevented from yielding, by the formation of new adhesions, not only lessens the mass of flesh provided for covering the bone, but gradually retracts it together with the superjacent integuments. The effect thus produced is favoured by the following circumstances. In the first place, by cutting the flaps of such moderate length that when brought together they merely meet without straining; secondly, by sawing the bone where it is exposed, by simply separating the flaps, instead of drawing the muscles back so as to divide it at a considerably higher point; and thirdly, by performing the operation at the lower third of the thigh. Mr Liston recommends amputating at the middle of the bone, upon the ground of thus forming a more convenient stump for the attachment of an artificial limb than would result from operating at a lower point.\* For my own part, I have, during many years past, advised this high operation, to prevent the great risk or almost certainty of protrusion to which the bone is exposed when divided at or near its lower third. But the flap operation being thus objectionable below the middle of the thigh, and even higher up, seldom in the end furnishing more than a covering of skin to the bone, it may be inquired how far the

\* Mr Gray of Davies Street, who is, I believe, the most eminent constructor of artificial limbs in London, informs me that, for the purpose of adaptation, he greatly prefers *long* stumps, especially of the thigh.



circular method deserves adoption in amputating at the lower third.

The true object of the circular incision is to provide a covering of skin for the bone ; and a great error has been committed by many, indeed almost all the would-be improvers of this operation, in directing their attention to modifying the division of the muscles, as if any form of their section could materially influence the result. All the attempts with this view have been directed so as in one way or other to give the cut surface of the muscles a conical form, evidently under the impression that they serve to assist in covering the bone. Now, it is quite clear, that if the ample masses of flesh afforded by the flap operation yield to the retractile agency of their tissue, the scanty portion obtained by any form of circular incision, cannot have the slightest effect in improving the condition of the stump. These wrong directed efforts would have done no harm unless they had withdrawn attention from what was really required to render the result satisfactory. In this way, however, they have seriously opposed improvement, and in my own instance, I confess, long prevented the truth from being distinctly seen.

The perfect condition of stump resulting from amputation at the ankle, where there is nothing but integument to protect the bone, led me to conclude, that if the circular operation could be performed with the certainty of providing such a covering, it might be employed with advantage in the lower third of the thigh ; which being the thinnest part of the limb, most readily admits of forming a stump composed merely

of skin. There is also, in operating here, plenty of room to apply the tourniquet without impeding the incisions or retraction of the muscles, and the size of the wound inflicted is, of course, much smaller than that of an amputation at the middle of the thigh. In the course of this summer I have performed the operation four times on adult patients, with the effect of confirming the favourable expectation which the considerations just mentioned had led me to entertain; and I now feel warranted to advise, that whenever a case requiring amputation of the thigh admits of the limb being removed at its lower third, the circular method should be employed.

The compress of the tourniquet should be applied over the artery close to the groin. Instead of the old-fashioned concave edged, thick-backed amputating knife, a middle-sized one of the kind employed for the flap operation, will be found more convenient. The incision of the skin should be made as near the knee as possible, not in a circular direction, but so as to form two semilunar edges, which may meet together in a line from side to side, without projecting at the corners. The fascia should be divided along with the integuments, which are thus more easily retracted—not by dissecting and turning them back, but by steadily drawing them upwards, through means of the assistant's hands firmly clasping the limb. This should be done to the extent of at least two inches, or more, if the thigh is unusually thick. The muscles are then to be divided as high as they have been exposed, by a circular sweep of the knife, directly down to the bone, from which they must be

separated and retracted with the utmost care. In ordinary circumstances, the retraction should not be less than two inches, and before using the saw, the bone must be completely exposed by means of a cloth split up the middle, applied on each side of it, and forcibly held up.

If due attention be paid to these directions, I feel confident that amputation by circular incision at the lower third of the thigh will afford satisfactory results, and should therefore be preferred to the flap operation, at a higher part of the limb, when the circumstances leave room for choice. Where it is necessary to amputate at or above the middle of the bone, there can be no question as to the propriety of operating by the flap method.

Before arriving at the conclusion which has just been explained, I thought that amputation at the knee might be employed, with advantage, as a substitute for the flap operation, at the middle of the thigh; and my opinion would still be so, if this alternative afforded the only room for choice. I operated at the knee with complete success in three cases, two of which were diseases of the joint; and the other a recent injury, from the leg having been torn off by machinery. But as the soft parts required to form the stump in this situation, are apt to be so deranged in their texture as to delay, though not prevent recovery, and thus, in some measure, counterbalance the advantage of exposing cancellated, instead of dense bone, together with the contents of its medullary cavity, I do not persist in advocating amputation at the knee, now when

satisfied that the operation by circular incision, if performed with due care, on proper principles, may be employed at the lower third of the thigh safely and advantageously.

## ARTICLE XIII.

## AXILLARY ANEURISM.

[FROM THE EDINBURGH MEDICAL AND SURGICAL JOURNAL, NO. 137.]

CASE I.—On the 15th of October last, I received an urgent summons to Inverness to see a gentleman who had met with a serious injury, and on my arrival learned the following particulars of the accident from Drs Robertson and Nicol, and Mr Fraser, who was the patient's ordinary attendant. On the 23d of September, the patient, twenty-three years of age, had been thrown out of a gig upon the road with great violence, and lighted on his left shoulder. When taken up he complained of pain and swelling in the arm-pit, and surgical assistance being immediately procured, it was at first thought that the humerus had been dislocated downwards. On more careful examination, it appeared that the bone was in its proper place, and that the hard tumour in the axilla, which had been mistaken for its head, depended on effusion of blood. The patient was kept quiet in bed, with cooling lotions applied to the injured



part. For a day or two the swelling increased, extending down the arm, and the side of the body, and attended with discoloration of the skin. A gradual improvement then took place in the uneasy feelings as well as the external appearance. But on the tenth day after the accident, a sensation of gushing was felt in the arm-pit, and the pain and tension suddenly became as great as ever. Leeches were applied, and the case again proceeded favourably for eight days, when another gush took place. Attacks of this kind then became more frequent, and at length occurred almost daily. They were always relieved by leeches, of which about 300 had been applied. I found the arm enormously swelled by œdematous effusion, which extended to the points of the fingers. A large fluctuating tumour occupied the axilla, and distended the pectoral muscle. There was no pulse at the wrist, and not the slightest movement or sound could be perceived in the swelling. The patient, worn out by pain, loss of blood, want of sleep, low diet, and apprehension, was reduced to a state of extreme weakness.

In these circumstances it seemed difficult to determine whether there was an axillary aneurism or merely a bloody effusion. The gushing sensation, and absence of pulse at the wrist, were in favour of the former view, while the complete absence of pulsation and aneurismal *bruit* in the tumour, from its commencement and during the whole period of its existence, could hardly be accounted for, except by the latter explanation. The case being thus doubtful, and as pressure had not been tried, it did not ap-

pear prudent to resort to any operation until the effect of careful bandaging had been ascertained. A flannel roller was accordingly applied from the fingers to the shoulder and round the chest.

As it was very uncertain what steps might in future be required, and quite impossible for me to assist in their execution, at so great a distance from home, the gentlemen above mentioned proposed that the patient should be conveyed to Edinburgh by the steam-boat. This plan was readily acceded to by him, and as the boat sailed the same evening for the last time that season, the preparations for his departure were immediately made. He bore the fatigue of getting on board and leaving the vessel, as well as the voyage itself, which occupied two days and nights, much better than could have been expected, and arrived at the lodgings provided for him here, in all respects better than when he left Inverness. He derived great comfort from the bandage; the swelling of the arm was considerably reduced: and there had been no return of the gushing sensation.

He continued in this satisfactory state for three days, but on the morning of the 24th sent for me on account of severe pain in the most prominent part of the swelling. This corresponded with the hollow of the axilla, and formed a round prominent tumour of a dark-red colour, apparently about to open. The patient was impressed with the idea that matter had formed, and entreated me to make an opening for its escape. Thinking that a small puncture might be made with safety, I introduced the point of a narrow bistoury, and finding that nothing issued, en-

larged the wound to the extent of half an inch, when a small clot of blood was squeezed out. Hoping from this, that there was merely a bloody effusion from the smaller arteries or large veins, I placed a piece of lint loosely upon the wound. Four hours afterwards, at eleven A. M., I changed the piece of lint, and a few minutes afterwards observed it wet with arterial blood, a jet of which immediately followed. By means of a pin thrust through the lips of the wound, and a ligature tied round it, I prevented further hemorrhage for the time, and then considered what was to be done, with Sir George Ballingall, and Mr Dewar of Dunfermline, who had happened to call. They concurred with me in thinking that the subclavian should be tied without delay, and this, with their assistance, was accordingly done.

The elevation of the clavicle by the axillary swelling, and the condensation of the cellular substance consequent upon the ecchymosis, of which the discoloration extended from the neck to the hip, rendered the operation more difficult than usual; and the artery not only lay deep, from being on the left side, but was overlapped by the cervical nerves to a great extent. These obstacles having been overcome, the artery was exposed, and tied with a single silk ligature. The patient passed the remainder of the day tranquilly, and next day when I saw him in the forenoon seemed to be going on well. But at two o'clock P. M., two or three ounces of blood escaped from the wound in the axilla, and a compress of lint was then secured over it by means of a spica bandage. At seven next morning, as the bleeding returned to a

somewhat larger extent, I stuffed the orifice with lint. At eleven A. M. it was thought right to lay open the cavity, turn out all the clots that could be reached, and apply graduated compresses. When the artery was thus exposed, it bled freely, but not with such force as to resist the pressure of the lint. In half an hour afterwards, however, the hemorrhage recurred, and as the temperature of the arm was then distinctly lower than natural, Sir George and I decided that the only remaining resource was amputation at the shoulder joint.

Drawing the patient to the edge of his bed, I readily removed the limb, and exposed to view a frightful cavity containing coagulated blood, extending as low down the side as the latissimus dorsi, and stretching forwards under the pectoral muscle. The artery appeared to have been torn across, immediately below the origin of the subscapular, through which the blood was flowing in a retrograde course; I tied it with one or two other vessels, scooped out all the clotted blood I could reach, and then stitched the edges of the wound together. The patient, for several hours after the operation, threatened to sink under this final act of his trials. He complained of nausea, and was deadly pale; his face was covered with cold perspiration; and his pulse could hardly be felt. Small quantities of wine were given to him frequently, and in the evening he revived; feeling warm and comparatively comfortable; the pulse became firm and could be counted, 160. Next day it was 140; the day following, 120; and so on until it fell to the natural state. In other



respects the improvement was equally progressive, and before the end of a week there was no room for anxiety except on account of the ligature above the clavicle. It was longer of separating than usual, but probably lay loose for some time before it came away, owing to the patient's extreme aversion to let it be touched. His recovery was complete, both in regard to the wound and the general health.

The points in this case most deserving of attention are, 1. the way in which the artery was ruptured; 2. the absence of pulsation and aneurismal bruit in the tumour; 3. the inefficacy of tying the arterial trunk at a distance from the rupture, and with the intervention of branches; and 4. the success of amputation in very desperate circumstances. Whether pulsation was prevented by the artery being torn entirely across, and whether ligature of the subclavian would have proved effectual if not preceded by puncture of the tumour, are questions which I leave to the consideration of the reader.

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[EXTRACTED FROM THE MONTHLY JOURNAL OF MEDICAL SCIENCE, 1846.]

CASE II.—In the beginning of July, Dr Cunningham of Glasgow called upon me with a gentleman suffering from an axillary aneurism, of which the following history was given:—

The patient, a stout square-made man, of short stature, fifty years of age, while, as he supposed, in perfectly good health, about a fortnight before, when getting hastily off a carriage, had made a false step,



and nearly fallen backwards. In the effort to prevent this, and to secure his hat, he was conscious of throwing his left arm upwards and backwards with great force. No inconvenience was noticed subsequently, until a few days after, when he felt a difficulty in keeping his arm close to the chest; and, upon searching for the cause of this, discovered a swelling in the arm-pit, which throbbed or pulsated. He immediately applied to Dr Cunningham, who, recognising an axillary aneurism, proposed a consultation.

I found the aneurism so large as to fill the axilla, but quite circumscribed, and distinctly pulsating. The pulse, at the wrist of the affected limb, was rather weaker than in the other arm. The complexion and general aspect of the patient were such as are usually supposed to denote disease of the heart; the pulse was irregularly intermittent, and the action of the heart was perceived over a larger extent than could be considered natural. But it was stated that there had been no alteration for a long while in the appearance of the patient, or in his ability for exertion, which was represented to be that of the most perfect health, and I could not detect any distinct evidence of serious organic alteration in the heart. Drs Christison and Begbie examined him at my request, and came to the same conclusion. It therefore seemed to me, that although the case could not be considered in any view as favourable to the success of an operation, it was, nevertheless, not one in which the patient should be refused the chance of escape thus afforded from the fatal result of his disease, which otherwise appeared all but certain.

He lost no time in coming to Edinburgh for the purpose of submitting to the operation ; and, upon doing so, to prepare for it was confined to bed on the antiphlogistic regimen.

On the day of his arrival, I remarked that the pulse throughout the affected arm had become very weak ; and on the following day I could not detect it either at the wrist or in the tumour, which, during the few days that had elapsed since I first saw it, had acquired a great increase of size. The prospect of spontaneous coagulation derived from this change, would have made me delay the operation, even if all other circumstances had been favourable to its performance. But the pulse became very quick ; the arm swelled to a large size from œdematous effusion ; and excessive pain was felt throughout the limb. On the following day, another unpleasant symptom was presented by a diffused blush over the fore-arm, of that peculiar hue which is wont to precede mortification, resulting from the inflammation of parts imperfectly supplied with blood. Small doses of antimonial wine, with the solution of muriate of morphia, were administered internally, to allay the general excitement ; and soothing lotions, containing opium, with acetate of lead, were applied to the seat of pain. On the morning of the 13th, the arm, from the elbow downwards, suddenly became cold and devoid of sensation. The redness, leaving this part, ascended towards the shoulder, the pulse could hardly be counted, and there was every sign of speedy sinking under the violence of constitutional reaction.

It was, therefore, with no less surprise than satis-

faction, that, during several succeeding days, this apparently hopeless condition was observed to assume gradually a more promising character. The arm which, from the time it became cold, had been simply wrapt in flannel, regained its proper temperature; the redness of the skin disappeared; the pain in a great measure subsided; and the patient resumed the state of tranquillity that had existed previously. The swelling of the arm also, which had attained an enormous extent, especially towards the axilla and shoulder, which it raised almost to the patient's ear, and stretched strangely outwards from his side, sustained a marked diminution.

In consideration of these encouraging changes, the hope of a spontaneous cure was again entertained, and the pulsation, which could be perceived only by the ear, was ascertained to be confined to an extent so small, that there could be no doubt as to coagulation having taken place throughout a large portion of the cavity. But on the back part of the shoulder, where the skin had been extremely distended, when the swelling was at its height, and had not since either regained its natural consistence, or lost the purple colour then assumed, there now began to be presented the appearance of a slough. It was hoped that this might be the effect of pressure limited to the integuments, and separation of the dead part was anxiously watched, with a view to ascertain whether it was confined to the surface, or extended to the cavity. In the course of a short time, the worst fears were verified by a gradual enlargement of the aperture, exposing to view a mass of coagulum and

sloughy muscular substance, through which arterial blood began to ooze, and stain the patient's shirt.

Upon the 16th of August, I requested Dr Duncan, together with Dr Cornwall, who had taken the ordinary management of the case, to consider what could be done to prevent the obviously impending hemorrhage, which threatened to prove speedily and almost instantly fatal. Ligature of the artery was quite out of the question, as the arm, though its temperature was restored, had not regained either sensation or voluntary motion, and, independently of all other objections to this operation under existing circumstances, would certainly have been deprived by it of the scanty vital power still remaining. I therefore proposed amputation at the shoulder joint, which met with approval, and, as there was no objection on the part of the patient, proceeded without delay to this formidable undertaking.

The patient having been brought to the edge of his bed, I made an incision from the acromion downwards and backwards through the sloughy aperture, and from the same point, another downwards and forwards over the joint, so as to unite their terminations at the lower part of the axilla, and form two nearly equal flaps, which, being held aside, allowed the disarticulation to be readily completed. As pressure could not be effected upon the vessel above the clavicle, in consequence of its elevation by the tumour, a fearful gush of blood issued from the cavity of the aneurism when laid open, but was instantly arrested by Dr Duncan, who placed his thumb upon the part from which he felt the jet proceed, and retained it there, until, by



the application of eight or ten ligatures, I prevented hemorrhage from the smaller vessels. Upon examining the state of the axillary artery, we found no distinct orifice, but merely a funnel-shaped expansion where it communicated with the aneurism. I therefore made an incision from the upper extremity of the wound quite to the clavicle, in the direction of the vessel, cut through the tendon of the pectoralis minor, and by careful dissection of the condensed textures in which it lay imbedded, exposed a sufficient portion of the artery for safely applying a ligature. This having been done, the edges of the wound were brought together, and retained by stitches, with the assistance of compresses and a bandage.

The patient bore the operation well, made no particular complaint after it, and steadily advanced towards recovery, although the separation of sloughs was not completed until the end of a fortnight. But while this process was gradually accomplished, the cavity rapidly contracted, so that when the whole of the dead parts were cast off, it was nearly closed. The ligature came away on the 15th of September, and the patient then returned to Glasgow, where he was soon afterwards able to resume the duties of a public situation, which he holds in that city.

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[FROM THE EDINBURGH MONTHLY JOURNAL OF MEDICAL SCIENCE,  
OCTOBER 1847.]

HAVING already placed upon record two instances of life being preserved, under very peculiar circumstances of axillary aneurism, by amputation at the



shoulder joint, I have now the more pleasing duty of relating a case of the same disease, remedied by ligation of the artery without removal of the limb.

CASE III.—A gentleman, thirty-four years of age, from the north of Scotland, recommended by Dr Ross of Tain, applied to me on the 25th of July, on account of an axillary aneurism of the right side. It was of a large size, filling the axilla, and pressing forward the pectoral muscle, so as to be distinctly perceptible through the clothes. The patient stated, that about sixteen years ago he had fallen down a stair, and, in an involuntary effort to save himself, had seized the railing with his right hand, and consequently sustained a very severe wrench of the limb. With exception of some pain, and the ordinary uneasiness attending such an injury, he had not afterwards suffered any noticeable inconvenience further than an occasional difference of temperature in the hands, until about ten months ago, when he began to suffer from pain in the little and ring fingers, which gradually became almost constant and extremely distressing. More lately, the axillary tumour had attracted attention. On the 29th, with the assistance of Drs Duncan and Mackenzie, I tied the subclavian artery, where it emerges from the scalenus anticus, by a single silk ligature, drawn with all the tightness in my power. No inconvenience whatever was experienced—the ligature separated on the fifteenth day, and the patient at the end of another fortnight returned home, perfectly free from pain, and with hardly any perceptible remnant of the tumour.

In performing the operation I made an incision along the clavicle, so as to extend over the edges of the sterno-mastoid and trapezius muscles, and another from the centre of this upwards, parallel with the edge of the latter muscle. The dissection was conducted entirely by the knife and forceps. The needle was passed under the artery, with its convexity upwards, and the ligature was tied by the unaided effort of the fingers. It has been advised to pass the needle with its convexity downwards, or towards the clavicle, with a view to protect the vein from injury. But this vessel is not at all in the way, while the cervical nerves are so situated in regard to the artery, as in general to render it nearly, if not quite, impossible to convey the ligature from below upwards. It has also been advised to employ the assistance of some mechanical contrivance for tightening the knot. But I feel persuaded that the thread will always be within reach of the fingers, and may be more safely tied by them simply, than with the intervention of any instrument.

## ARTICLE XIV.

## ON THE TREATMENT OF POPLITEAL ANEURISM.

[FIRST NOTICE, FROM THE EDINBURGH MONTHLY JOURNAL OF MEDICAL SCIENCE, JANUARY 1841.]

CASE I.—Henry Williams, aged thirty-six, a weaver, was admitted on the 20th May 1839, on the recommendation of Mr Cunningham of Kirkcaldy, to have the femoral artery tied for popliteal aneurism. The tumour occupied the hollow of the ham—it was circumscribed in form—and, from the distinctness of its pulsation, seemed to contain little coagulum. The patient's attention had been first directed to the complaint about two months before, by an uneasy feeling of stiffness in the part, after a particularly severe day's work.

He was confined to bed, and ordered a laxative to prepare him for the operation. Next day the pulsation had become extremely obscure, and though it slightly returned the following day, at the end of two days more it could not be perceived at all. The articular arteries were then felt much enlarged, and the tumour quickly diminished in size, while it increased

in firmness, until merely a small knot the size of an olive remained. He was dismissed at his own desire on the 31st of May.

CASE II.—William Sinclair, aged twenty-six, was admitted on the 20th of November 1839, on account of a pulsating tumour in the popliteal space of his left leg. It was about the size of an egg, and distinctly circumscribed. The patient stated he had first remarked the swelling and beating in the month of August, while serving as carpenter on board a whale-ship in the North seas.

The femoral artery was tied on the 3d of December. The ligature separated on the 28th, and the patient was dismissed quite well on the 9th of January.

CASE III.—John Lockie, aged twenty-nine, a shop-keeper in Edinburgh, was admitted on the 17th of April 1840, on account of a large pulsating tumour occupying the ham and calf of the right leg. There was considerable œdematous swelling of the limb from the knee downwards, and over the shin bone there were some dark coloured spots, which had been produced by the pressure of a carefully applied flannel bandage, thus denoting a great degree of weakness in the part. The patient stated, that, about a month before admission, while walking down to Leith, he had strained the knee, and, in consequence, almost immediately afterwards perceived a beating tumour in the ham.

The artery was tied on the 30th of April, and though no unpleasant symptom followed, the swelling

was slow in undergoing absorption; so that, when he was dismissed on the 3d of June, there still remained some enlargement of the limb. He nevertheless was able to resume his employment, and perform a full share of active duty; but about a fortnight ago observed a swelling in the calf of the leg, which has since opened spontaneously, and discharged a large quantity of matter, mixed with coagulated blood,—no doubt the remains of the extensive effusion which existed previously to the ligature of the vessel.

The first of these cases is curious, from the spontaneous cure occurring while the aneurism was still small and circumscribed, and the circumstances consequently unfavourable for coagulation. The second case was very similar to it, and I delayed the operation for a fortnight, to afford the chance of recovery without its performance, which might be derived from perfect rest and the pressure of a bandage. The third case seemed rather unfavourable, from the large size and sudden extension of the swelling; and the recovery was accordingly much slower than usual, though ultimately effected. It has been a question whether an early or advanced stage of the disease is more favourable for success,—the undilated state of the anastomosing vessels being considered adverse in the former, and the quantity of extravasated blood an obstacle in the latter. From all that has fallen within my own observation, I should have no hesitation in preferring to operate at an early period, having never witnessed in my own practice the slightest unpleasant symptom of defective circulation, however small and recent the tumour might be.



Of all the operations performed for aneurism, ligature of the femoral artery is, I believe, justly regarded the easiest, either on the dead subject or on the living body, and yet the bad consequences which attend it are distinguished by their severity as well as frequency. For my own part I have been fortunate, having tied the vessel seven times for aneurism with success. But within the period of doing so, I am not aware of any case that has terminated favourably in this city, while I have either seen or heard of four that ended badly, viz. one by inflammation of the vein, one by mortification, one by hemorrhage, and one by amputation. It is usual to attribute untoward occurrences to some peculiarity in the constitution of the part or patient; and there can be little doubt that varieties of this kind may have some influence over the result. But I feel quite sure that attention to some minute points in performing the operation, has a much larger share in determining whether it shall be favourable or unfavourable.

It is established that the great sources of danger from the ligature of large arteries, are undue laceration and separation of the connexions of the vessel, whence hemorrhage is apt to ensue; and injury to the coats of the veins, which is apt to occasion inflammation, and an obstructing coagulation, causing mortification of the limb. The subclavian artery, when tied at the external edge of the scalenus, lies at some distance from the vein, and neither the carotid nor the external iliac artery, adheres so intimately to its accompanying venous trunk, as to render it at all difficult or dangerous to pass the needle. But the

femoral artery has a closer connexion with the vein, and though it is felt by the operator's finger, after the fascia has been opened, round and distinct, and as if insulated from the surrounding parts, except by the loosest connexions, any attempt to pass the ligature, without further dissection, either proves abortive, or, if executed by force, exposes the patient to the greatest danger. I have seen a gush of dark coloured blood proclaim transfixion of the vein; I have seen on dissection a portion of this vessel included in the ligature; and I have also seen the external coat alone grazed, as it were, by the needle, but nevertheless excited to fatal inflammation. If, on the other hand, this danger be avoided by using blunt instruments, or, the finger, to detach the artery from its connexions, the patient is exposed to the hardly less disastrous consequence of hemorrhage, through ulceration or sloughing of the vessel.

To tie the femoral artery safely, the surgeon should be impressed with the conviction that the operation is one not of difficulty, but of great nicety. He should make an incision between two and a half and three inches long in the proper situation, cut through the fascia to a smaller extent, and expose the sheath of the vessels. So far he can hardly go wrong; but then, instead of hastening to pass his needle, he should, by ligature, or the temporary application of spring forceps, close every little vessel that discharges enough of blood to obscure distinct vision of the object he has in view. Let him now seize the sheath with dissecting forceps, and, gently raising it, make a small opening by means of a straight narrow

sharp-pointed knife. The cellular and fatty substances which envelope the vessels in variable quantity, are next to be elevated and divided in successive portions, until the external coat of the artery appears quite distinct and *white*, when the needle may be passed without the slightest difficulty or danger. I am quite aware that instructions to the same effect are contained in the common books of surgery ; but believing, for the reasons above stated, that sufficient attention in practice has not been bestowed upon them, I think it right thus seriously, and diffusely as it may seem, to repeat and enforce these directions.

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[SECOND NOTICE FROM THE EDINBURGH MONTHLY JOURNAL OF MEDICAL SCIENCE, NOVEMBER 1842.]

CASE IV.—*Femoral Aneurism—Operation—Recovery.*—William Garrick, aged seventeen, from Shetland, was admitted into the hospital on the 20th of May 1841, on account of an aneurism of the femoral artery. He stated that, in the latter part of February, when cutting a piece of wood with the large knife used by seamen, he had accidentally thrust the blade into the inner side of his left thigh, a little below the middle. A great gush of blood immediately sprung out, but was speedily arrested by the pressure of four half crowns which he had the presence of mind to apply firmly over the wound. In a few days, the bandage being taken off, it was found that the wound had healed, and nothing unusual was noticed until a week

afterwards, when he perceived a sort of thrilling sensation at the injured part. This increased daily, and in the course of another week, a pulsating tumour, the size of a small hen's egg, was noticed; he still took no alarm, but finding that the tumour progressively increased, at length applied to a surgeon, who explained the nature of his case, and sent him off to Edinburgh.

When admitted, he complained of coldness in the limb, which was also slightly œdematous, notwithstanding the support of a flannel bandage which had been put on before he left home. The tumour was about the size of a goose's egg, had a strong uniformly distending pulsation, though not very distinctly defined, and lay under the lower edge of the sartorius. The sac could be readily emptied by pressure, either directly over it or on the trunk of the artery at the brim of the pelvis, so as to make all trace of the swelling disappear.

It was thought in this case, that simple ligature of the femoral would not prove sufficient for effecting a cure; and that, as in brachial aneurism, from wounding the artery in venesection, it would be necessary, after opening the sac, to tie the vessel on both sides of its aperture; but for my own part, I did not despair of success, from merely obstructing the artery above the tumour, since the anastomosing circulation beyond it was much less free than at the bend of the elbow. At the same time I greatly dreaded the danger of conveying ligatures round the artery, where it lay within the sac, in close proximity to the vein, or not improbably almost incorporated with it by the

pressure of the blood. I therefore resolved to try the effect of simply tying the femoral in the ordinary way, as this proceeding seemed to be safe in itself, and in the event of failure, promised to present no obstacle to adopting the other alternative.

The operation was performed on the 26th; the pulsation ceased immediately and completely without any return; the swelling diminished daily; the ligature separated on the 14th of June (the eighteenth day); and the patient went home cured on the 23d of the same month.

3. *Fracture of the Leg—Sloughing—Hemorrhage—Ligature of the Femoral Artery—Recovery.*—Jane Wood, aged sixty-two, was admitted on the 9th of April 1841. She had suffered a simple fracture of the tibia and fibula, which through careless treatment became compound, with extensive suppuration and undermining of the integuments and muscles. About the middle of May the sore took on a sloughing disposition, and rapidly enlarged, exposing the tendons and united bones. On the 1st of June a sudden gush of blood took place from the situation of the posterior tibial artery, but ceased immediately through the application of cold and elevation of the limb. In the middle of the following night at least two pounds of blood were lost before the house surgeon could be summoned; and as the hemorrhage then did not continue, slight pressure merely was applied. At nine o'clock the following morning (the 2d) blood gushed out as violently as ever, and firm compression was effected over the part from which it



proceeded. I was then sent for, and tied the femoral artery in the usual way, above the crossing of the sartorius. The following extracts from the hospital journal will show the patient's subsequent progress :—

“*June 15th.* From the day the artery was tied, there has been no bleeding ; the foot has remained of good temperature ; and there has been no extension of the sloughing. The sloughs are now nearly all separated, and the sphacelated tendons were to-day divided, to keep the foot at rest, as the fracture was constantly disturbed by twitching of the muscles. Little or no union has taken place between the bones, but the limb is retained in a good position, being laid on its outside in a leather splint, with the knee bent. *The wound made on tying the artery united by the first intention, without discharging a drop of matter.*

“*July 22d.* The wound is contracting steadily. Union is distinctly taking place in the fracture, and the general appearance of the patient is distinctly improved.

“*September 1st.* The bones are firmly united, and the sore is nearly healed. She has been out of bed several times, and takes her food well. The ligature separated on the 38th day.”

The recovery of this emaciated unhealthy-looking old woman, under the circumstances now detailed, was certainly very unexpected and surprising. It ought, I believe, to be ascribed chiefly to the unremitting attention of Dr Mackenzie, my clerk in the hospital, under whose immediate care she was after the fracture became compound.

4. *Popliteal Aneurism—Operation—Recovery.*—Archibald Hamilton, aged twenty-five, was admitted on the 26th of August 1841, on account of a popliteal aneurism. He stated, that pain in the left ham had been felt about five weeks, but the tumour only for three, and that it had not increased in size, except slightly, during the last week, when in the course of his employment as porter, his foot slipped while he was descending a trap stair. The swelling was found to occupy the hollow of the ham completely. It was circumscribed, and pulsated strongly. The artery was tied on the 30th; the ligature separated close to the knot on the 6th of October. He was dismissed cured on the 27th.

5. *Popliteal Aneurism—Operation—Recovery.*—Robert Anderson, aged thirty-three, was admitted on the 15th of February 1842. He stated that his employment consisted in loading the Canal luggage boats, and that in the course of it he had frequently occasion to leap ashore with all his force. About a month before, his right leg had suddenly become stiff, benumbed, and swelled below the knee, but did not prevent him from discharging his duty during the following fortnight, at the end of which he for the first time noticed a pulsating tumour in the ham. He then applied a poultice, and sent for a surgeon, who told him the nature of his complaint, and made him keep quiet in bed. Finding no improvement, he entered the hospital, to undergo the operation requisite for his relief. There was then still some œdema of the leg, and congestion of the

veins below the knee. The aneurism was circumscribed, but filled the popliteal space. It pulsated strongly, and could be emptied by pressure on the femoral artery. I performed the operation on the 17th. On the 27th of March the ligature separated close to the knot, and on the 31st he was dismissed cured.

6. *Popliteal Aneurism—Operation—Recovery.*—John Pearson, aged forty-two, was admitted on the 13th of July 1842, on account of a popliteal aneurism, which completely occupied the right ham. He stated, that in the course of his employment as a plasterer, he was going down a ladder about six weeks before, when, without being conscious of straining, or otherwise hurting himself, he suddenly felt the right foot and ankle stiff, and in going home, observed them to be slightly swollen. He continued at his work for several days, but then noticed a tumour in the ham, and confined himself to bed.

The artery was tied on the 19th, the ligature separated on the 13th of August, and he was dismissed cured on the 12th of September.

These cases of popliteal aneurism show how insidiously the disease commences, since there can be no doubt, that in all of them it had existed much longer than the patients supposed. Aneurism, wherever situated, does not appear to be in itself the source of painful sensations, or, until coagulation is far advanced, to affect the circulation in any material degree. It is only when the tumour becomes so large as to press injuriously upon the neighbouring parts,

that symptoms of appreciable importance present themselves. In these there will of course be some variety, corresponding with the difference of organs and textures concerned; but from the nearly constant vicinity of large veins and nerves, the predominant signs are usually œdema, coldness, and pain. The absence of characters apt to attract the attention of patients in the early stage, should not be lost sight of in the diagnosis of the disease. I once operated upon a major of dragoons, who had unquestionably laboured for many months under aneurism of the ham, without being aware that he did so, or relinquishing his professional duties, and who actually followed the hounds with unabated energy the very day before the existence of a large pulsating tumour was ascertained. In another case which came under my care, the patient, a captain in the army, had been treated during six months for sprain of the ankle, before it was discovered that he suffered from a popliteal aneurism, though in all probability it had originated from the same exertion that injured the joint, in leaping from the summit of a rotten paling in the pursuit of partridges which his dog had pointed.

In two of the cases, it will be remarked that the ligature separated at the knot, leaving the noose which surrounded the artery. This was owing to the length of time the thread remained in the wound (thirty-six, and forty days), and that again must be ascribed to the small amount of local disturbance caused by the operation. The more the artery is detached, and the more its neighbouring textures are torn or contused, the more rapidly and extensively

does ulcerative absorption ensue; and when hemorrhage takes place, it is almost sure to do so within sixteen days from the date of the operation. Slow separation of the ligature, therefore, augurs safety; and if the thread remain so long as to rot, and leave a portion in the wound, it does not appear that there is reason to apprehend any troublesome consequence; but if separation of the entire ligature should be particularly desired, it will be proper to twist the thread a little every day after the end of the third week.

In some remarks on the ligature of the femoral artery, published in the first Number of this Journal (January 1841), the object of which was to enforce the importance of some minutiae in the process, I stated, that in no instance had any of my patients suffered the slightest bad consequence from the operation, and I am still able to say so. It is true, that in one case, the aneurism, being large and diffused, was not cured, though dissection, eight months afterwards, showed that the artery had been obstructed for several inches at the part where the ligature was applied. But this result, of course, has nothing to do with the success of the operation for obstructing the vessel.

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[THIRD NOTICE, FROM THE LONDON AND EDINBURGH MONTHLY JOURNAL  
OF MEDICAL SCIENCE, OCTOBER 1844.]

*Popliteal Aneurism in a Child.*—David Dand, a stout healthy-looking boy, nine years of age, was admitted on the 19th of February, recom-



mended by Dr Lumgair of Largo, to undergo the operation for popliteal aneurism. The tumour extended from the lower part of the popliteal space under the bellies of the gastrocnemii muscles, so as to distend the calf of the leg. When examined by the hand, it was felt quite circumscribed, and pulsated distinctly. The swelling disappeared entirely under moderate compression, and quickly returned when the pressure was withdrawn. The same effects resulted from temporary compression of the femoral artery. It was stated that the disease had been first noticed about two years before, soon after the boy had completed his seventh year, and that it had occasioned little uneasiness, but that the swelling had latterly enlarged with increasing rapidity, so as to excite alarm for the consequences of its progress if allowed to proceed unchecked.

I tied the femoral artery on the 24th; no unpleasant symptom was caused by the operation, immediately after which the pulsation ceased, and the swelling could no longer be felt. In its place, however, there was soon to be perceived a solid tumour of coagulum, which gradually increased in firmness, and diminished in size. The ligature came away on the 4th of March (the 14th day), and the patient was dismissed on the 21st.

The age of this patient at first led my colleagues and myself to entertain doubts as to the disease being truly an aneurism, similar to what is met with in adults. But the diagnostic characters were so well marked, that we decided on tying the artery; and the effects of the operation most satisfactorily demon-

strated that the nature of the case was really no other than it had appeared to be. Sir A. Cooper has stated,\* that the earliest age at which he had met with aneurism was eleven years, the patient being a boy in St Thomas's Hospital, and the artery affected the anterior tibial. A gentleman who attended my lectures last winter (Dr Peach), told me that he had witnessed the amputation of a child's thigh for popliteal aneurism of very large size; and another gentleman whom I had the pleasure of regarding as a pupil at the same time (Dr Croft), mentioned that he had seen in the museum of an English provincial hospital the preparation of a carotid aneurism, for which the artery had been tied without success in a child of seven or eight years of age. But I am not acquainted with any instance of aneurism being remedied by the modern operation at so early a period of life as in the case just related.

It may here be not improper to notice the attempt which has lately been made to introduce compression of the femoral artery instead of its ligature for the treatment of aneurism. In the early part of the present century, before the principles on which arteries may be tied with safety had been established, while ligatures of reserve, rolls of plaster, and broad tapes were employed for the purpose, and no harm was anticipated from extensively detaching the vessel to be tied from its neighbouring connexions, various instruments were contrived for pressing upon the femoral artery† without impeding circulation through

\* Lectures on Surgery, vol. ii. p. 41.

† Boyer, *Traité de Malad. Chirurg.*, vol. ii. p. 234.

the limb, and repeatedly employed with success in cases of popliteal aneurism. But the suffering endured by the patients was so severe and prolonged, during the tedious process of recovery thus accomplished, that we find surgeons in whose hands this method had proved successful, preferring to it the Hunterian process, with all its early imperfections, or even encountering the horrors of the old operation, rather than inflict the permanent agony of the screw. The sensation caused by continued pressure over the vessel, however carefully applied, if sufficiently forcible to prove effectual, is of a peculiarly intolerable kind, and must be endured for a space of time, not to be reckoned by minutes, or even hours, but by days, weeks, or months. Formidable consequences also occasionally occur, in the shape of ulcerations, and sloughs, or swelling of the limb. And there can be little doubt, that if the method in question were generally adopted, so as to bring under its influence the variety of constitutions which are prone to resent such treatment, there would not be wanting even fatal results to strengthen the objections that might be urged against its adoption. It should be kept in view, that the field for resorting to the use of pressure is limited to the femoral artery, as the superior extremity is liable only to traumatic aneurisms, which are best treated by double ligature of the wounded vessel, while the carotid, subclavian, and iliac arteries, are placed beyond the reach of compression. But the femoral artery may be tied with so much ease, so little suffering, and such perfect safety, that the laborious, distressing, and tedious procedure, which has lately

been brought again into notice by a surgeon of Dublin, will probably soon return to the obscurity in which it had very properly been allowed to slumber. For my own part, having tied the femoral artery thirteen times for aneurism, and never met with the slightest symptom of an unpleasant nature from the operation, I see no reason to deviate from the line of practice hitherto pursued.

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[FOURTH NOTICE, FROM THE EDINBURGH MONTHLY JOURNAL OF MEDICAL SCIENCE, FEBRUARY 1847.]

WALTER BROWN, aged forty-two, a cooper in Leith, was admitted into the hospital on the 22d of September 1846, on account of a popliteal aneurism, which occupied the hollow of the right ham completely, but was distinctly circumscribed. It had been first noticed about two months before, and being then of a considerable size, may have existed for a longer period.

He could not explain how the disease originated, farther than by stating, that in his employment vigorous exertion of the limbs was frequently required.

The artery was tied on the 2d of October, with hardly any complaint on the part of the patient, and the loss of not more than a tea-spoonful of blood. No painful sensation or any other unpleasant symptom followed, and the patient lay perfectly easy and tranquil, until the ligature separated on the 36th day; the aneurismal tumour having by this time almost en-

tirely disappeared. The patient was then allowed to resume the use of his limb, and left the hospital on the 9th of November.

In the case now related, I tied the femoral artery for the *sixteenth* time, without experiencing any bad effects from the operation. Much blame has been imputed to me, both publicly and privately, for adhering to this mode of treatment, in disregard of the pressure system, which has lately been revived, and I am told that whatever may have been my own good fortune in escaping unfavourable results, it is not justifiable for me, as a teacher of clinical surgery, to pursue a practice which has proved in general very dangerous, while there is another that may be adopted with perfect safety. To remonstrances on such grounds, respectful attention is due; and I have therefore deemed it my duty to make a careful inquiry into the present state of the question, illustrated, as it has been, by the accumulated facts of several years.

With regard to the ligature, it appears that this operation admits of being performed so as to be nearly, if not entirely, free from danger. I have undertaken it in every case that presented itself, although the circumstances were often very unpromising, and even when erysipelas as well as hospital sore infested the clinical wards of the Royal Infirmary. Mr Busk, surgeon of the Dreadnought Hospital Ship, also, as will be seen from the subjoined letter, has tied the artery nine times without any bad effect; so that the operation has thus been performed in twenty-five cases with no unpleasant consequence.



This success cannot be ascribed to mere good fortune, and certainly has not depended upon any peculiarity in the process, or its performance, which may not be generally adopted.

There is now, I believe, no difference of opinion as to the proper principles of the operation. They are, *1st*, To dissect, with the knife and forceps, instead of tearing or scratching with a blunt instrument, to expose the artery. *2d*, To denude no more of the vessel than what is requisite for passing the needle. *3d*, To use for ligature the smallest silk thread possessing sufficient strength, and tying it as tightly as possible. *4th*, To treat the wound so as to favour union by the first intention. As to the performance of the operation, I believe that there is no arterial trunk in the body which requires for its ligature so little anatomical skill, or manual dexterity, as the femoral artery. The angle formed by the sartorius and adductor longus affords a sure guide to the vessel; and in the event of any error as to the position of the external incision, the fibres of these muscles, by their different directions, at once show the operator on which side he has exceeded. But while the mere detection of the artery is abundantly easy, it must be admitted that the subsequent part of the operation is beset with extreme danger from any want of caution or nicety, since, if the vessel be roughly detached from its connexions, hemorrhage will probably result; and if the vein be wounded, the patient will almost certainly perish from inflammation of the vessel, or mortification of the limb. Care is always required, and must be employed in a degree proportioned to

the intimacy with which the artery is connected to its neighbouring parts. I have completed the operation in less than a minute, and on other occasions have found nearly half an hour requisite for the purpose. If all operators had paid as little regard to the time occupied, I believe that the unfavourable results on record would not have been so numerous as they are. The operation, therefore, I believe, being performed upon proper principles, and with sufficient care, may be regarded as perfectly safe.

If this position be well founded, the grand argument in favour of compressing, instead of tying the artery, has no room to stand, since the danger alleged to attend ligature of the vessel is what gives importance to a mode of treatment claiming to be altogether free from risk. But I some years ago expressed the fear that compression, when tried in a variety of cases, would not be found quite so safe as its advocates anticipated. "Formidable consequences also occasionally occur, in the shape of ulcerations, and sloughs, or swelling of the limb, and there can be little doubt, that if the method in question were generally adopted, so as to bring under its influence the variety of constitutions which are prone to resent such treatment, there would not be wanting even fatal results to strengthen the objections that might be urged against its adoption."\* It may now be inquired how far this anticipation has been realized.

The following case, reported by Mr Bellingham,

\* Monthly Journal of Medical Science, October 1844.

affords an example of the bad effects that may proceed directly from compression, and it is hardly necessary to remark that the "acupuncture" employed in its progress nowise affected the result :—

" Patient, a butcher, aged thirty-eight, unhealthy, labouring under anasarca, anæmia, and enlargement of the heart, with signs of valvular disease, admitted into St Vincent's Hospital, under Mr Bellingham, February 10th, 1846, with popliteal aneurism upon the left side. Patient is accustomed to carry heavy loads, but never received any injury ; tumour noticed about eight months previously, soon after which he entered another hospital ; compression was used, but he left it about the middle of last December. The aneurism is about the size of a hen's egg ; it diminishes, but does not disappear on compressing the artery in the groin ; the limb is œdematous.

" Compression commenced soon after the patient's admission ; pressure made by a weight in the groin, and by a clamp upon the artery at the junction of the middle with the lower third of the thigh. After the compression had been continued for some time, as the pulsation continued to be strong, it was resolved to give a trial to galvanism combined with compression. By applying pressure upon the artery above and below the aneurism, so as to retain the contents of the sac until acted on by the galvanic current, it was expected that one of the principal causes of the failure of this proceeding would be avoided ; the case likewise seemed to be a favourable one, in this respect that the blood contained a very large amount of serum in proportion to the fibrine.

“ April 21st. A clamp was applied upon the artery above the aneurismal sac, and another below it; two acupuncture needles (insulated except at their points and hafts) were then introduced from opposite sides into the aneurismal sac, and brought into connexion with a Smee’s battery by Dr Apjohn, professor of chemistry to the Royal College of Surgeons, who kindly afforded his services, and the galvanic current was maintained by him for about fifteen minutes at intervals. It was intended to repeat the application after a short interval, and in the mean time the patient continued the compression. In order to hasten the cure (as he thought) he had kept up very strong pressure upon the artery in the thigh for many hours, when, seven days after the employment of the galvano-puncture, he was seized with a shivering, erysipelas (which was prevalent at the time) attacked the part of the thigh upon which the pad of the instrument rested, it spread upwards and downwards, and the patient died on the 4th of May, six days afterwards.” \*

The following case, kindly communicated to me by Mr Busk, shows that in unfavourable circumstances the defective circulation caused by compression may prove fatal to the limb:—

*Extract of a Letter from George Busk, Esq., to Dr Stewart, Deputy Inspector of Naval Hospitals, dated Greenwich, Dec. 2, 1846.*

“ I am very glad to furnish you with the particu-

\* Dublin Med. Press, Oct. 14, 1846, p. 246.

lars of the case of Popliteal Aneurism treated by pressure upon the artery, for Mr Syme's information. Though little can be said on the subject from a single case, and that in some respects exceptionable, I quite agree with him in thinking that the new mode of treating aneurism in the ham, offers but little or no advantage over the Hunterian operation, when skilfully performed. It is more tedious, and, on the whole, undoubtedly more painful, and, as the present case shows, is not free from one at least of the same risks as attend the operation of tying the artery, viz. gangrene of the limb, from the stoppage of the circulation, gradually as it appeared in this case to have been effected.

"CASE.—J. B., æt. twenty-nine, was admitted on the 11th December 1845 ; a man of healthy aspect, and who had always enjoyed good health. He complained of painful swelling of the whole of the left knee joint, which was distended evidently with synovial effusion ; but, on stricter examination, an aneurismal tumour, about the size of a goose's egg, but flattened, and with a powerful thrilling impulse, was detected in the popliteal space. The affection appeared, from his account, to have commenced without assignable cause, and with a pungent pain in the ham, on the 30th November, or twelve days only previously. Pressure on the femoral readily stayed the pulsation in the tumour, which was then almost wholly dispersed. The knee joint, however, was permanently distended with fluid effusion, and was painful on motion. I determined, in what seemed such a favourable case, to employ the mode of treatment by pressure, which



was adopted in the following mode :—The limb was carefully bandaged from the toes up to the groin with a long narrow firm pad along the course of the femoral artery, and with a broad wooden splint applied on the back of the thigh, upon which splint one extremity of the Italian tourniquet was fixed, and the other, brought round the outside of the thigh, pressed upon the superficial femoral a little above Scarpa's angle, and a few turns of the screw sufficed to command the artery completely, without compressing any other part of the limb. The handle of the instrument was committed to the patient's own care, with directions to turn it one way or the other, as his feelings of pain induced him. The pressure which he kept up, without causing himself any pain, was not at all times sufficient to stop the pulsation in the tumour, though he usually effected this for some part of the day, but merely materially to lessen it. No particular change took place for several days, at the end of which, however, it was found requisite to relax the bandages on the limb, owing to the tension produced by the tendency to swelling, apparently arising from pressure on the femoral vein. This relaxation relieved the pain every where, except in the knee, which continued painful and much swelled. The tumour remained stationary, and, at the end of about ten days, the pulsation in it was much less powerful, and it appeared to be becoming solid. The man never complained of the pressure of the tourniquet, which was completely under his own control; but about this time he began to feel considerable pain in the foot and inside of the leg, which

seemed to be referrible to the course of the saphenus nerve. He became feverish, and had one or two chills, but there was nothing very remarkable till the fourteenth day after commencing the application of the pressure, on which morning pulsation could not be at all felt in the now solid remains of the much diminished tumour. The knee was much swelled, red, and painful, and a suspicious-looking white spot had made its appearance on the dorsum of the foot. The pressure of the tourniquet, which had been almost nothing for twenty-four hours, was entirely removed, and assiduous friction of the leg and foot was kept up, with fomentation to the knee. The gangrenous spot, however, by evening, had become more decided, and rapidly increased, and, on the following day, the whole leg, about half-way up the calf, was cold and insensible, and very rapidly fell into complete gangrene. This gangrene then extended more slowly nearly up to the knee, and in the course of two or three days appeared inclined to reach no further. He complained still very much of the knee, and I consequently thought it advisable (though, under the circumstances, very reluctantly) to remove the limb in the lower third of the thigh. The man, however, scarcely rallied from the shock of this operation, and died in about four days with diffuse gangrene of the lungs.

“The femoral artery at the site of pressure presented no sign of alteration, and seemed to be of the natural size downwards. In the ham was a firm, hard, aneurismal tumour, about the size of a hen’s egg, situated on the anterior aspect of the artery,

with which it communicated by a large ragged opening. The cavity of the sac was occupied in great part by firm, laminated, fibrinous coagula, and quite in the centre by a softer, grumous clot. The cellular tissue surrounding the tumour, was infiltrated with pus, and the capsule of the knee joint was perforated by a small ulcerated opening, caused evidently by the pressure of the aneurismal tumour. The joint contained a large quantity of turbid synovial fluid, and the synovial membrane, except on the cartilages, was minutely injected.

“From this short account you will observe, that the gangrene of the limb was probably coincident with the cessation of the flow of blood through the aneurismal sac and popliteal artery, the collateral circulation at the same time not having been satisfactorily established, owing perhaps to the morbid condition of the textures surrounding the knee joint. It is of course impossible to say whether, under these circumstances, the old operation would have been attended with a more happy result; though I am inclined myself to think that it would, principally for the reason that the mischief in and about the knee, would, in a great degree, have been prevented by an earlier dispersion of the aneurism. I have tied the femoral artery nine times—eight for popliteal and once for femoral aneurism, and always successfully, as far as the operation was concerned. That is, I never had secondary hemorrhage nor gangrene. In the femoral aneurism, the sac suppurated, and the man died some months afterwards, worn out by the discharge and other disease; and in one case of pop-

liteal (diffuse), amputation of the limb was required, eighteen months or two years afterwards, in consequence of gangrene (slow) of the foot, after exposure to cold. The others were completely successful, and the average time of confinement to bed, about fifteen or sixteen days. In my opinion the operation is less painful and attended with as little risk, when properly performed, as the mode of treatment by pressure."

The following case, I think, tends to show that, in a patient labouring under complicated disease of the circulating system, prolonged obstruction to the flow of blood through so large a portion of the body as the whole inferior extremity, may prove seriously hurtful. The advocates of pressure are accustomed to assert that the sudden obstruction caused by ligature, must occasion much more inconvenience than the gradual effect of pressure. But this statement is altogether opposed to experience; and although we may not be able to explain it fully, there can be no doubt of the fact, that infinitely less disturbance, either locally or generally, results from the complete stoppage effected by ligature, than from merely impeded circulation, whether caused by external pressure, or produced by swelling in the interior of a limb.

"Mr Newcombe now produced the morbid specimens, including the heart, which were taken from the individual just alluded to by Mr Cusack, as having been the subject of the popliteal aneurism which had been treated by compression. The man, æt. thirty, as Mr Cusack had observed, died very unfortunately just as the cure was effected. He was admitted to



Steevens' hospital about a month since, labouring under popliteal aneurism, having at the same time strong and violent action of the heart, so much so, that all the superficial arteries could be seen pulsating, exhibiting a well-marked aneurismal diathesis. Immediately after his admission to hospital, pressure was applied to the femoral artery in the same manner as had been done in other cases which were recently before the society. He became so restless from its effects (though he was watched most carefully), that it was resolved to discontinue its use for some days. Examination with the stethoscope had detected the presence of patency of both semilunar and mitral valves, accompanied with considerable hypertrophy of the left ventricle. He was now left quiet for ten days, the pressure having been resumed, however, a fortnight before his death. On the ninth day after the reapplication of the pressure, symptoms of improvement (which hitherto had been trifling indeed) were manifest. Slight thickening of the sac had been previously observable at times, but it always disappeared in a few hours. Towards the evening of last Monday, the sac had increased in thickness, and the pulsation in the tumour was much weaker when even a moderate degree of pressure was kept up. On Wednesday the tumour was completely free from pulsation, though the amount of pressure was very slight. However, the instruments were left on till Friday evening, when he died in the sudden way described by Mr Cusack. This case possessed a considerable degree of interest, inasmuch as, even with the unfavourable condition of the heart and arteries



displayed by the preparation on the table, a complete cure has been effected, as the society could see in the preparation of the tumour now before them. The tumour, he observed, was now considerably smaller than when the treatment had been commenced. The artery was pervious down to within one-fourth of an inch of the tumour; it was there filled by a firm coagulum, which extended into the sac, and completely filled it. The sac was at the anterior part of the artery, and communicated with the latter by a large round opening, which may perhaps account for the length of time the coagulum took in forming. The patient had suffered a good deal from pain and tenderness in the tumour, which the fact of a nerve passing directly over the tumour will account for. Both anterior and posterior tibial arteries were pervious, and appeared to carry on their usual functions. The pressure had been chiefly confined to the portion of the femoral artery near the origin of the profunda; here some slight thickening of the cellular tissue surrounding the vessel was observed, but there was no change whatever visible in the vessel itself. The heart was much enlarged: great hypertrophy of left ventricle. The *carneæ columnæ* would be also seen very much larger than was natural. The arch of the aorta was dilated and somewhat thinner than usual; on looking down from it to the semilunar valves, an open space may be seen, the valves being thin and weak. The mitral valves contained some hard deposits, and are also slightly patent. The left ventricle and the arch of the aorta contained fluid blood at the time of the examination,

which was made about six hours after the death of the patient.” \*

It will be remarked that this patient was rendered “restless” by the pressure, and died forty-eight hours after pulsation ceased to be felt, while the tourniquet still remained applied to the limb. Yet, in a tabular statement by the editor of the Dublin Medical Journal,† this case is entered as “Cured;” and in another notice of it by the same author, the patient is said to have “died suddenly of disease of the heart before leaving the hospital.” Indeed, there appears to be some peculiarity in the Dublin reports on this subject, since, with regard to another case, it is said, that “after recovery the popliteal artery of the affected limb pulsated as strongly as that of the sound one,” which is plainly quite impossible, if there really had been an aneurism.

Independently of the danger that might proceed directly from compression, I regarded the risk of failure as a very serious objection to this method, not merely with reference to its rendering profitless the patient’s suffering and confinement, but still more on account of the difficulty that might afterwards be experienced in performing the operation, from thickening and condensation of textures caused by the pressure. Many instances of failure have come to my knowledge, and I am also credibly informed that the apprehension just expressed has been fully verified by experience. But as the operators have not

\* Dub. Med. Press, April 30, 1845, p. 275.

† Dub. Journ. of Med. Science, Aug. 1846, p. 129.

thought proper to publish their cases, they can at present be only referred to in a general way, as confirming this opinion ; which, indeed, requires no further support than what is afforded by Mr Cusack's case, already related, as in it there is the evidence of dissection, that "thickening of the cellular tissue surrounding the vessel" may result from even a comparatively moderate degree of pressure. On the whole, there is reason to believe that the ligature, when properly performed, is safer than compression. But I need not insist upon this reason of preference, and may next inquire into their relative superiority, with reference to the respective degree of facility and suffering that attends their employment.

The ligature is usually accomplished in two or three minutes, without any trouble to the operator, and hardly any pain to the patient, who, after the skin is divided, seldom expresses more than a slight feeling of uneasiness ; and even when difficulty is experienced in detaching the vessel, the operation, though protracted in duration, is attended with little additional pain. If the sheath of the vessel be opened on the outer or fibular side, by slightly withdrawing the edge of the sartorius muscle, there is little risk of cutting any arterial branch, and the hemorrhage seldom exceeds one or two tea-spoonfuls. The wound generally unites by the first intention, and when it does not do so, heals by granulation without pain or inconvenience. The patient during his confinement lies in perfect tranquillity, sleeping soundly, taking with appetite the food given to him, and able to be amused by reading, writing, or conversation.

Pressure on the trunk of an artery sufficient to arrest or impede the flow of blood through it, notwithstanding all that has been done by mechanical contrivance to lessen the inconvenience of its effects, must always be more or less distressing to the patient, by the local uneasy feelings and general commotion of the system which it occasions. Few, indeed, would submit to it, except through their dread of an operation represented to them with alarming features; and not a few have insisted upon encountering the knife, notwithstanding all their apprehensions, rather than prolong their martyrdom under the tourniquet. In twenty-three cases of aneurism, reported by Mr Bellingham, from the practice of seventeen surgeons, as successfully treated by pressure, I find that the average duration, not of the treatment, but of the actual compression, excluding the intervals of its discontinuance, amounted to thirty-eight days. Thirty-eight days and nights of misery, to escape a few minutes of trivial uneasiness!

The question between ligature and compression seems very much the same as that between passing a catheter and puncturing the bladder for retention of urine. If the surgeon can with safety relieve his patient by means of the catheter, he should certainly do it. But if, instead of drawing off the water, he can in this way only lacerate the urethra, and make false passages through it, his duty is plainly to thrust a trocar into the bladder. Now, as it is not likely that all the gentlemen I have from year to year the honour of addressing in my lectures, will be able, throughout the whole course of their practice, to



avoid puncturing the bladder; it may be thought improper for me, during seventeen years' discharge of hospital duty, to have never resorted to this operation—even in a single instance. But while a clinical teacher has to regard the interest of his pupils, as well as those of his patients, the former must always be held secondary to the latter. If it is in his power to afford relief by the catheter, he is bound to do so; and, on the same principle, so long as it is my sincere persuasion that ligature of the artery is preferable to pressure, for the cure of popliteal aneurism, I shall deem it my duty to pursue this method, though it may not, perhaps, be the best adapted for the lowest capacity of surgical practice. Puncture of the bladder and compression of the femoral artery may be useful expedients when circumstances forbid the adoption of better means—and I am far from desiring that either the one or the other should be excluded from the practice of surgery; but it would surely be unreasonable to insist upon these clumsy, painful, and I will add dangerous, methods of treatment being employed upon all occasions, instead of those which, when properly executed, are easy, gentle, and safe. Puncturing the bladder is certainly better than leaving the patient to his fate, or aggravating it by mischievous poking with catheters; and compression of the artery is undoubtedly better than its rude or careless ligature. Let every man act according to his ability; but let no one who feels it necessary to choose inferior means, throw blame upon those who feel warranted to practise a higher exercise of their art.



## ARTICLE XV.

## ON FUNGUS OF THE TESTICLE.

[FROM THE LONDON AND EDINBURGH MONTHLY JOURNAL OF MEDICAL  
SCIENCE, JANUARY 1845.]

IN the year 1808, Mr Lawrence published a paper in the *Edinburgh Medical and Surgical Journal*, on what he entitled “a peculiar affection of the testis, attended with the growth of a fungus from that organ.” The objects of this communication were to point out a disease which, though of frequent occurrence in practice, he believed had not been described by any surgical writer, and to show that the operation of castration was not, as had been supposed, requisite for its remedy. “The patient,” says Mr Lawrence, “has generally assigned some blow or other injury as the cause of the complaint; in other instances it has originated in the hernia humoralis from gonorrhœa, and sometimes has appeared spontaneously. A painful swelling of the gland, particularly characterised by its hardness, is the first appearance of the disease. After a certain length of time, the scrotum, growing gradually thinner, ulcerates; but the opening which

is thus formed, instead of discharging matter, gives issue to a firm, and generally insensible fungus. The surrounding integuments and cellular substance are thickened and indurated by the complaint, so that there appears to be altogether a considerable mass of disease. The pain abates, and the swelling subsides considerably, when the scrotum has given way. In this state, the disorder appears very indolent; but if the fungus be destroyed by any means, the integuments come together, and a cicatrix ensues, which is inseparably connected to the testicle.

“An examination of the part, while the fungus still remains, discloses to us the fact, that this growth has its origin in the glandular substance of the testis itself; that the coats of the part are destroyed to a certain extent; and that a protrusion of the tubuli seminiferi takes place through the aperture thus formed. I have often ascertained the continuity of the excrescences with the pulpy substance of the testis, of which we shall find more or less remaining, according to the difference in the period of the disorder. It appears to me, that the glandular part of the testis experiences an inflammatory affection in the first instance, in consequence of the violence inflicted on it; and that the confinement of the swollen substance, by the dense and unyielding tunica albuginea, sufficiently explains the peculiar hardness of the tumour, and the pain which is always attendant on this stage of the disorder. The absorption of the coats of the testis, and of the scrotum, obviates the tension of the parts, and thereby restores ease to the patient, at the same time that the fungus makes its

appearance externally." Having thus described the disease, and explained its nature, Mr Lawrence recommended removal of the fungus by means of escharotics, ligature, or the knife, which he preferred as the proper mode of treatment, instead of castration ; and then related several cases, in illustration of these views, practical as well as pathological, which he had been led by observation to adopt.

The subject, thus placed in so clear a light, has for many years been familiar to the profession ; and though it would be easy for any one knowing the disease to find allusions implying acquaintance with it in the works of earlier writers, the merit of originality is justly due to Mr Lawrence for directing attention to fungus of the testicle, and determining its proper position in the system of morbid anatomy. But the establishment of a treatment so much more mild and creditable to surgery than that which had formerly been employed for its remedy, constitutes a stronger claim of merit, and one to which his right is still less liable to be disputed ; since where we find the disease most distinctly noticed, removal of the organ is held to be its only remedy. Thus, in stating the circumstances that require castration, Sabatier tells us, that "when in the progress of an abscess occasioned by an injury of any sort, or proceeding from internal causes, there issues from its opening a fleshy fungus, which swells out, and expands over the edge on all sides, discharging thin and ill-digested matter, we must resort to this operation."\*

\* Médecine Operatoire, 1796, t i. p 401

Still, however, fungus of the testicle could not be considered a satisfactory subject of surgical practice, for it was plain that a portion of the gland must be sacrificed in order to preserve the remainder; and, as appears from dissection, the destruction, with this view, may require to be carried so far as to leave nothing more than the epididymis. It was found, too, that the treatment, whether conducted by escharotics or the knife, was necessarily tedious, so as even to extend over a period of many months. Indeed, Mr Lawrence admits that the inconvenience thus experienced, may induce a patient to propose, and a surgeon to perform removal of the testicle, on the ground of expediency. I have therefore great pleasure in communicating a mode of treatment which completely remedies both of these imperfections,—by preserving the testicle entire, and completing recovery in a much shorter time than even if the summary process of castration were adopted.

When the fungus growth is divided longitudinally, that is, from the base towards the circumference, it may be seen to consist of two textures, distinguished by their colour and arrangement. One is brown, and disposed in straight lines, radiating from the base, where they are nearly or quite close together, towards the circumference, where they are more or less apart, according to the size of the excrescence. The other is white and granular, lying in the spaces which are afforded by the diverging rays. The former is composed of the tubuli seminiferi, altered in situation but not in structure, while the latter is simply organisable lymph that has been effused into the interstices.

The relative proportion of these textures may be seen best by making successive sections of the fungus, parallel with its base. Here the substance of the testicle appears little if at all altered, and presents a mass of uniform brownish colour. But in proceeding towards the circumference, each slice shows more and more of the white interstitial substance, until it seems to be the sole constituent. In addition to these facts, which are within reach of the naked eye, Mr John Goodsir detected in a fungus, which I gave him for examination, by the microscope, that it was covered externally by a thin layer of substance possessing the characters of a granulating surface. So that the excrescence might be regarded as merely an extreme degree of exuberant granulation, or what in vulgar language is called "proud flesh."

This observation suggested to me the idea, that by the use of proper means the fungus might be made to retrace its steps, through absorption of the white substance and gradual approximation of the brown, and that the granulating materials of the surface might thus be enabled to complete the healing process. Pressure was obviously the agent on which reliance should be chiefly placed for producing the effect desired with this view, and the most convenient mode of compressing the growth seemed to be enclosing it within its proper covering of the scrotum. There is no loss of substance in this part, as the fungus, issuing through a small ulcerated orifice, merely presses the integuments aside, so that they are found lying in loose folds above the dense ring that encircles the neck of the protruded mass. It must



therefore be easy to obtain, from this source, an abundant supply of materials for the purpose.

In my Clinical Lectures I explained these principles, and tested their soundness on two patients in the hospital, with the following satisfactory results:—

CASE I.—Andrew Ayton, aged twenty-six, from Penicuick, was admitted on the 8th of January last, on account of sores upon his legs, and a fungous excrescence from the testicle, about the size of a filbert. On the 15th I cut round the fungus, and extended the incision upwards as well as downwards, so as to give it an elliptical form. The integuments were then separated on each side, and brought over the growth, where they were retained by three stitches. The scrotum was supported by plasters and a bandage. It appeared at first as if union by the first intention had taken place completely; but part of the wound suppurated, without, however, showing the slightest disposition to protrude. The patient might have been allowed to go home soon after the operation, but was retained until the wound had fairly cicatrized, and left the hospital on the 9th of February.

As the fungus in this instance was of a small size, the following case, which exhibited the disease in its most formidable aspect, will probably be considered better evidence in favour of the treatment—though, I believe the truth to be, that the obstacle to recovery is greater when the excrescence is small, than when it has attained a larger extent, since the tendency to protrusion must be stronger in the former condition than in the latter.

CASE II.—William Smith, aged thirty-eight, from Berwick-on-Tweed, recommended by Dr Cahill, was admitted on the 13th of October last, on account of a fungus of the testicle. It was of a large size,—and in fact comprised nearly the whole testicle, so that hardly any thing more than the cord and epididymis remained within the scrotum. It was attributed to the effects of a blow.

On the 15th, I proceeded as in the former case, but of course found it necessary to make a much more extensive separation of the scrotal integuments, in order to obtain a covering for the fungus. Complete reduction having been effected, the edges of the wound were stitched together, and carefully supported by straps of adhesive plaster applied round the scrotum, which had been shaved to permit their employment. A T bandage was then put on to keep the parts more securely steady. No unpleasant symptom followed the operation, and at the end of a fortnight the cure might be considered nearly complete; and I believe would have been so, if the thick and indurated margin of integuments surrounding the neck of the fungus had been cut away. But in the course of another week there could be no hesitation in regarding the patient as entirely well.

It was well said by an excellent surgical writer of the last century, that “a grain of matter of fact to a practical surgeon is worth a pound of reasoning;” and I accordingly hope, that the results of these cases will outweigh the various speculative objections which have been, or may be urged against the practice now proposed. The only one of these which I think it

worth while to notice, as being the principal difficulty *a priori* with gentlemen for whose opinion I have much respect, is, that the surface of the fungus would not unite with the superinduced integuments. For my own part, I never entertained any apprehension of inconvenience from this source, and fully expected—what we now see actually happens—that the surface of the fungus, being coated by a texture of a granulating nature, would unite with the raw surface of the integuments so soon as it became encrusted with effused lymph. But even if this union had not taken place, the object in view would still have been attained, though not quite so speedily, by shrinking of the fungus through absorption of the substance effused into the interstices of its tubular texture, and contraction of the granulating cavity in which it lay, until cicatrization was completed. It is now ascertained that the shorter process is followed; and, in order to facilitate it as much as possible, I think it will be expedient always to remove the hard ring of skin through which the fungus protrudes, so that the whole integument concerned may be competent for adhesive action not only on the surface, but also between its edges.

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Since the publication of this paper, the plan of treatment it proposed has been extensively practised, and, so far as I know, with uniform success.

## ARTICLE XVI.

ON BURSAL SWELLING OF THE WRIST AND PALM OF  
THE HAND.

[FROM MONTHLY JOURNAL OF MEDICAL SCIENCE, 1844.]

THERE are few subjects of surgical practice that have occasioned more trouble and disappointment than morbid distension of the bursa, which accompanies the flexor tendons of the fore arm in their course under the annular ligament of the wrist, towards the fingers. The resistance of the ligament prevents any enlargement of the bursa where lying under it; but the wrist and palm become distended, so as to occasion an unseemly swelling, and weakness of the hand. The fluid effused into the cavity is generally associated with numerous small cartilaginous-looking bodies, of a lozenge or lenticular figure.

In treating this form of ganglion, the means generally employed prove very unsatisfactory in their effect. Blisters and pressure are altogether unavailing. Punctures either heal without producing any improvement, or remain open, so as to occasion obstinate sinuses. Incisions of larger extent, caustics,

and setons, have all been carefully employed with very uncertain benefit, and frequently great suffering; indeed, I have known the continued irritation so induced prove fatal. As the treatment of similar derangements in other parts of the body is not attended with such troublesome consequences, the question naturally presents itself, what local peculiarity is concerned in causing the obstinacy of this particular case? The reply suggested by what has fallen within my observation is, that the constriction caused by the annular ligament produces the effect in question, by preventing the portion of bursal sac corresponding to it and the subjacent tendons from undergoing the healing process. Impressed with this conviction, I tried the following experiment, the complete success of which encourages me to hope that the method pursued will be found to afford an effectual remedy for a complaint which has hitherto proved so troublesome.

Janet Preston, aged twenty, was admitted on the 13th of February, complaining of pain and weakness in her left hand. The wrist and palm of the hand were much swelled, but not discoloured, and pressure on these parts caused distinct fluctuation, with the jarring sensation that characterises effusion into the bursal sheaths. She stated that pain had been first felt about two years before, and that for the last twelve months she had hardly any use of the hand, in consequence of the swelling, and weakness attending it.

I made a free incision from the wrist into the palm of the hand, dividing the annular ligament. This



gave vent to a quantity of glairy fluid, with many small flat cartilaginous-looking bodies, and exposed to view the flexor tendons, separated and surrounded by thickened bursal membrane. The cavity was filled with dry lint, supported by a bandage moderately compressing the hand and wrist. In the subsequent treatment care was taken to prevent protrusion of the tendons, by drawing the edges of the wound together, and applying a compress over the seat of the annular ligament. Not the slightest disagreeable symptom followed the operation, and three days after it the patient was able to sew, which she had been prevented from doing for many months previously. In the course of a few weeks the wound healed, and the limb was in every respect perfectly sound.

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My colleague in the hospital, Dr Duncan, repeated this operation with perfect success, and I have performed it in three other cases with the same satisfactory result. It may therefore be considered as affording safe, speedy, and effectual relief, from a disease rendering the hand affected nearly, if not quite useless, and, under the influence of remedial means previously in use, nearly, if not quite incurable.

## ARTICLE XVII.

ON LATERAL CURVATURE OF THE SPINE,  
AND WRY NECK.

THE following paper was published at a time when the recent introduction of "Tenotomy," or the subcutaneous division of tendons and muscles, had so dazzled not only the profession but the public, that every proposal for its application met with a ready reception, and no statement as to its success seemed incredible, however much it might be opposed to reason and common sense. In the sounder state of judgment upon the subject which now exists, the language employed may appear unnecessarily strong. But as my testimony against the practice in question was quoted in the journals of Paris, where it originated, and may have had some influence in promoting its discontinuance, I reprint the paper without alteration.

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[FROM THE EDINBURGH MONTHLY JOURNAL, APRIL 1843.]

WHEN, some time ago, it was proposed to remedy lateral curvature of the spine by dividing the muscles

of the back, and when cases in which this preposterous practice had been adopted were published, every honest and well-informed member of the surgical profession must have experienced the strongest feelings of disgust and indignation. The only consolation was, that the absurdity of the proposal could not be long overlooked, even by the public, and would prevent much mischief from being sustained, until the salutary influence of time over such follies should interpose its usual protection of oblivion. But though years have passed, I still find that the hopes so improperly excited have not yet been abandoned, and am frequently placed in the painful situation of having to decline the performance of operations for curvature of the spine, on patients who had been led to expect complete and immediate relief from this source. The object of the following remarks is to discourage all thoughts of an operation in the ordinary form of the disease, and to point out one particular case in which the only remedy is afforded by the knife.

In tracing the origin of lateral curvature, it is not easy to determine whether the muscles or the bones should be considered chiefly in fault. The former, through weakness or injurious habits, allow the spine to assume a bent shape; and the latter, from deficiency of their ordinary rigidity, yielding to the unequal pressure thus occasioned, suffer a corresponding distortion. Sex, age, and tight lacing, may conduce to these effects; but they are doubtless promoted in no small degree by the enervating influence of modern education, which strains and over-fatigues the mental faculties, at a period of life when energy of body, the

moral sentiments, and powers of observation, should rather be cultivated. This pernicious system not only destroys the appetite for wholesome study at its proper season, but seriously endangers health, and in all probability contributes to the present frequency of spinal complaints.

So long as the bones preserve their natural forms, the patient, by a voluntary effort, or by assuming the horizontal position, can at once make the curvature disappear; and if care be at this time taken, by attention to the general health, the disuse of stays, avoiding sitting or standing still, and frequently reclining on a flat surface, the distorting process may be easily and certainly arrested. It too frequently happens, however, that when a medical man is consulted at this stage of the complaint, finding the bones unaltered in shape, and the spine readily straightened, he is misled to form and express the opinion, that there is nothing really wrong. He attributes the apprehension to over-anxiety, and dismisses the case with the comforting assurance, that it will soon be all right. At length the bones do give way, the curvature can no longer be rectified, the ribs become flattened, the sternum projects, and the sad truth being then too apparent, means of remedy are sought for on all sides. But the time for beneficial interference has unhappily gone by. The exercises which formerly might have *prevented* the curvature, must now tend to increase it, by the superincumbent pressure of the head and shoulders, while the invigorating measures which might have fortified the bones against the distorting influence, must confirm

them in the faulty forms they have assumed. Mechanical support in the erect posture is worse than useless, since it impairs the muscular power that remains, without effectually relieving the trunk from pressure; and the complicated apparatus for effacing the deformity, by pulling, squeezing, and exercising in the horizontal posture, though certainly more plausible in theory, if I may judge from the results of such practical trials as that I have happened to witness, owe more of the credit placed in them to the confident statements of their respective projectors, than to the improvement they have actually accomplished.

It is no wonder, then, that when an operation for the cure of confirmed lateral curvature was proclaimed as safe, speedy, and effectual, the hopes of all interested in the complaint were powerfully excited. This operation consisted in dividing certain muscles of the back, on the contracted state of which it was alleged the distortion depended. But nothing could be more erroneous than this view of the case, since the muscles throughout its production and existence are entirely passive. They from the first do not draw the spine awry, but allow it to bend, their fault being weakness, and not undue contraction; so that those requiring to be corrected are seated on the convexity of the curve instead of its concavity, and, it is needless to add, could not be strengthened by division of their substance. The operation, therefore, should be banished from respectable practice, and if it survives this merited disgrace, be committed to those members of the profession who are base enough to take advan-



tage of their patients' credulity for the sake of gain or unworthy notoriety.

But there is one particular condition of the complaint certainly not common; yet, judging from the number of cases that have fallen within my own observation, I should say not extremely rare, in which complete relief may be afforded by the division of a muscle, and in no other way. I allude to spinal curvature depending upon wry neck caused by contraction of the sterno-mastoid. This muscle is liable to contraction, both spasmodic and permanent. The former does not, so far as I have seen, affect the shape of the spine, and, in two cases treated by division, did not yield to the operation. But the latter is apt to produce lateral curvature in every degree, and may be remedied with no less ease than certainty by sub-cutaneous incision.

Wry neck, like club foot, is sometimes congenital, but much more frequently, like squinting and the *pes equinus*, occurs during childhood, in connexion with some inflammatory or feverish state of the system. It depends upon a contracted state of the sterno-mastoid muscle, which has usually the feeling and appearance of a tense cord stretching from the clavicle to the ear. The head is bent towards the side affected, the face being turned in the opposite direction. Until the introduction of sub-cutaneous incision, the treatment of this complaint was very defective, since it consisted either in the use of mechanical support, which did little, if any good, or in cutting across the contracted muscle, together with its superjacent integuments, which was a painful and

bloody operation, leaving a large sore, slow to heal, and apt to renew the evil during cicatrization. The subcutaneous process requires merely a puncture of the skin, is not attended with pain or bleeding, needs no dressing or after-treatment, and at once affords the relief desired. The following is the first case on record of its performance in Great Britain, which I extract from my tenth report of the Edinburgh Surgical Hospital :—

“ *Wry Neck, depending on Contraction of the Sterno-Mastoid, remedied by Division of the Muscle.* —Matthew Cullen, aged six, Dunbar, admitted November 2, 1832. The head was much inclined to the left side, and could not be elevated, owing to the rigid contraction of the left sterno-mastoid, the sternal part of which felt like a tense cord. The complaint had existed upwards of twelve months, and had resisted blisters, with other similar means of remedy. In these circumstances, it was thought necessary to divide the contracted part of the muscle. This was effected by entering a sharp-pointed narrow knife a little to the inner side of its tracheal margin, about an inch above the clavicle, and then pressing the blade against the tense fibres. A sudden snap, which shook the patient's frame, was immediately perceived, and all trace of the contraction disappeared. The knife was withdrawn, and the small puncture occasioned by it in passing through the skin afforded the only perceptible indication of what had been done. No pain or other bad consequence followed, and the cure might be regarded as at once complete.”\*

\* Edinburgh Medical and Surgical Journal, p. 115.

In the case just related, the disease existed in its simplest form, and without any spinal affection, which is seldom wanting. The affection of the spine proceeds from involuntary elevation of the shoulder on the side affected, to lessen the strain on the head. This necessarily gives the dorsal part of the spine a corresponding convexity; and the lumbar portion bending in an opposite direction, to preserve the balance of the trunk, there results a lateral curvature, in no respect different, so far as regards appearance, from its ordinary condition. I was asked, along with Sir Charles Bell, to see a young gentleman suffering from lateral curvature. Finding the right sterno-mastoid very much contracted, I proposed to divide it, and did so with the effect of correcting the state of the spine immediately, so that before we left the house the youth was walking straight.

But if the distortion be permitted to continue, it sooner or later, as in the ordinary form of the disease, leads to alteration in the shape of the bones. The bodies of the vertebræ are compressed, and the sternum projects. In this case, of course, the operation cannot afford the same instant relief that follows its performance while the curvature depends merely upon muscular action. The head, however, is at once set free, to the patient's great comfort; and, through the gradual improvement of time, the trunk, unless arrived at full maturity, may in a great measure regain its proper conformation. A few weeks ago, I saw, with Mr Cruickshank of Hill Place, a young lady from this neighbourhood, on whom I performed the operation in January 1841. The back

and ribs were then so much distorted, that I hardly ventured to hope for much improvement, especially as the patient was nearly twenty years of age. It was therefore an agreeable surprise to find, instead of the low, thin, sallow, crooked, sickly-looking girl I had formerly seen, an erect, fresh-coloured, happy, healthy-looking young woman.

There is still another condition of the complaint, of which I may mention an instance that came within my notice last summer, in the case of a boy who was brought from the country on account of lateral curvature. Observing that his head inclined to one side, I examined the sterno-mastoid, and found it, not tense and rigid as I expected, but soft and yielding. I perceived, however, that when an attempt was made to raise the head, the muscle resisted and became tense, and therefore concluded that it was the seat of the evil. Under this impression I proceeded to divide it, and succeeded in doing so, though with more difficulty than usual, from the want of tension, for which it was necessary to compensate by stretching the neck. A good effect was immediately perceptible, and the following day the patient's back was comparatively straight, which it has since, I am informed, become completely.

In concluding these remarks, it may be well to warn against mistaking for wry neck depending upon muscular contraction, the distorted position of the head which proceeds from caries between the occiput and atlas. The latter disease, like the former, usually occurs in young persons, presents to a careless observer similar symptoms, and, if confounded

with it, leads to treatment not only useless, but extremely injurious. A young gentleman had for twelve months used friction and exercise under the direction of his medical attendant, who supposed that he laboured under wry neck from contraction of the sterno-mastoid. No benefit having been experienced, it was thought that an operation might be serviceable, and with this view I was asked to see the patient. He presented all the characters and well-marked symptoms of *spondylarthrocace*, or caries of the occipito-vertebral articulation, in a stage so advanced, that there was nothing left for me but to explain the nature of the case and predict the fatal termination, which soon afterwards happened.

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Since the publication of this paper I have operated in several other cases with the same success, and without ever causing any unpleasant symptoms. In no instance has it ever been necessary to divide both the clavicular and sternal portions of the muscle, and in the course of my experience, only one case requiring division of the former has occurred.

There is a spasmodic contraction of the sterno-mastoid, fortunately of rare occurrence, but which requires to be carefully distinguished from the ordinary form of the disease, as dividing the muscle for it affords no relief. I have met with only three cases of this kind. In one of them, the patient, a gentleman whom I saw with the late Dr Shortt in 1828, had the sternal part of the muscle divided, together with the integuments, without experiencing any per-



manent benefit. In another case, seen along with Sir C. Bell and Dr Scott, I also divided the muscle, but by sub-cutaneous incision, and without any benefit at the time, although the patient, a gentleman from Roxburghshire, I have been informed, afterwards recovered spontaneously. The characters which distinguish this form of wry neck are so strongly marked, that they cannot be overlooked even by one who has not seen similar cases before.

## ARTICLE XVIII.

## ON EXCISION OF THE ELBOW JOINT.

OF all the articulations in the body, there are only two which admit of being cut out with advantage for the removal of carious bone. These are the shoulder and elbow joints. The occipital and vertebral articulations, for obvious reasons, are quite inaccessible. The hip joint, when the seat of caries, is almost always chiefly affected on the acetabular side. The knee joint may be excised, but not with the effect of preserving a limb so useful as an artificial substitute after amputation of the thigh. I tried the operation, nearly twenty years ago, on a boy, who recovered perfectly from it, and seemed at first to possess a limb little inferior to its fellow, except in so far as it was stiff at the knee. But, in the course of time, it was found that the growth of the two limbs was not equal, and that the one which had been the subject of operation gradually diminished in respective length, until it wanted several inches of reaching the ground, when the patient stood erect. The ankle joint, according to M. Moreau's experience, may be cut out, but

requires a very long and tedious process for recovery, which, when completed, does not afford a support for the body nearly so efficient and convenient as amputation at the ankle has been lately found to do. The wrist joint from its complex carpal articulations, with the numerous tendons, nerves, and blood-vessels passing over it, could hardly admit of caries being extirpated from it by excision, and certainly not so as to preserve a hand of the smallest use. The only remaining joints are those which have been mentioned as proper subjects for the operation; and I have already stated the grounds for believing, that amputation at the shoulder is almost always preferable to excision of this joint, so that the field for excision would seem nearly limited to the elbow.

In this situation every thing is favourable to the operation. The bones are thinly covered behind, so as to be easily accessible on that side. Their cancellated texture, to which the carious disease is limited, has a small and well-defined extent. The muscles of most importance, together with the nerves and blood-vessels, need not suffer any injury; and the limb preserved is infinitely more useful than any substitute which art can fabricate, or wealth procure.

In the year 1826, soon after operating with success upon a shoulder joint (p. 58), I had placed under my care a young gentleman labouring under disease of the elbow, which, after a prolonged and careful treatment, so affected his general health as to show the necessity of some decided measure of relief. I proposed excision of the joint; but not being able to

obtain the sanction of any senior practitioner for an operation which had not been performed in Great Britain, I was compelled to choose the only alternative, and amputate the arm. Soon afterwards another case occurred, in which, as the disease seemed limited to the olecranon, I tried the effect of removing this part of the joint, but with such imperfect success, that it subsequently became necessary to excise the remaining part of the articulation. Being thus encouraged to undertake the operation, I published, in the *Edinburgh Medical Journal* of April 1829, "Three Cases in which the Elbow Joint was successfully excised;" and in 1831, a "Treatise on the Excision of Diseased Joints," in which fourteen cases of operations on the elbow joint are recorded. Since that time I have regularly practised this operation in all cases that appeared suited for its performance, and have now employed it on at least sixty or seventy occasions, with results which have induced many members of the profession to adopt this procedure, and removed the scruples of its most determined opponents.

In order to perform the operation with success, it is necessary to pursue a proper plan, grounded upon correct principles. Before describing the mode of operating which I have found most convenient, it may be of use to explain the views which led me to its adoption; and for this purpose the following extract from my original paper of 1829 will probably be most satisfactory :—

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[FROM THE EDINBURGH MEDICAL AND SURGICAL JOURNAL, 1829.]

Though few surgeons now make the mistake, so frequently committed not many years ago, of confounding caries with necrosis, the former of these diseases still remains in much obscurity and uncertainty, whether we regard its pathology or treatment. It is not my intention at present to write a treatise on this subject, but merely to notice some particulars concerning it which seem deserving of attention from practitioners.

Caries is generally seated in bones possessing a cellular or open texture, and when it occurs in those of the tabular or cylindrical kind, it is uniformly preceded by a morbid expansion of the compact structure into a state resembling that which naturally belongs to those where the disease usually resides. Every body knows that the shafts of bones, and especially the tibia, in consequence of chronic inflammation, are frequently enlarged, thickened, and at the same time loosened in their texture, which comes to have nearly the same appearance as that of the spongy articulating extremities. In bones so altered caries occasionally occurs, or I should rather say a condition resembling caries, since it differs from this disease in one important feature, viz. *incurability*. I have hardly ever known this spurious caries resist the local application of blisters, and internal use of oxymuriate of mercury;\* and I have felt very

\* Corrosive sublimate was considered the best antidote for the other preparations of mercury, before the use of iodine was introduced for this purpose.



uncomfortable in seeing extensive incisions, rasping, trephining, and glowing choppers bristling with actual cauteries, employed ineffectually to cure complaints admitting of such easy remedy.

True caries then may be said, without any exception, to occur always in spongy or cellular bone, and the appearance of the diseased portion is extremely uniform. Surgeons formerly described many different kinds of caries, the dry and the moist, the worm-eaten, and the fleshy, &c. &c.; but this variety of description depended on a confusion of caries with other morbid states of the osseous tissue, which ought to have been, as they are now, very carefully distinguished. The carious bone, after maceration, looks as if it had been burnt, being harder, whiter, and more brittle than usual, and there being always more or less excavation so as to expose the cellular structure, it greatly resembles a piece of loaf-sugar which has been partially dissolved by momentary immersion in hot water.

It is of much importance to recollect that caries seldom affects the bone to much depth. Thus we often see an articulating extremity carious over its surface, and sound in the centre. At other times we find it hollowed out into a cavity, the inner surface of which is carious, while the external shell is sound. The very limited extent of the disease often contrasts remarkably with the extreme obstinacy and severity of its symptoms. Thus, there is in my possession a thigh bone which I took from the body of a woman who had laboured under caries of the trochanter major for thirteen years, yet the whole dis-

case may be covered by the point of a finger, and is not thicker than a sixpence.

Among the characters of caries, we find mentioned a fetid discoloured discharge; but any surgeon who trusted to such an indication would be greatly deceived, since, as far as I have seen, the matter can seldom be distinguished from that which does not proceed from bone, or what is usually called healthy pus.

Caries cannot, like necrosis, be induced directly by the effect of violence. It depends on a peculiar morbid action, which is probably in all cases preceded by inflammation. Many people think that pressure may induce the disease, but they do so erroneously. It is true that pressure, such as that of an aneurism, causes absorption of bone, and gives rise to an appearance which might be mistaken for caries by an inexperienced or careless observer, but could never for a moment impose upon any one acquainted with the distinctive characters of the disease. The surface exposed by simple absorption differs in no respect from that which would have appeared if the excavation had been effected by violence. We do not here perceive the hardness, whiteness, and brittleness of caries, neither is there any matter secreted from it; and so soon as the cause is removed, the disease ceases. The effect of pressure in causing absorption without inducing caries, is well seen in those cases of necrosis where internal exfoliation occurs, and the confined pus makes a way for its escape through the cylindrical walls of the bone, since the sides of these passages so produced by absorption, through the effect of pressure, are in no respect carious,

or unfit for healthy action. Deep-seated collections of matter ought to be evacuated early to relieve the patient from pain, or prevent extension of the fluid, but no apprehension need be entertained of caries being produced by its pressure.

Inflammation, as already stated, most generally, if not always, precedes this morbid condition ; but it is worthy of recollection that inflammation and even suppuration of bone are not necessarily followed by caries. In cases of compound fracture, amputation, excision of joints, &c., we every day see bones suppurate and granulate in the most satisfactory manner. We observe the same thing occasionally in joints which become anchylosed after being the seat of abscess. There can be no doubt, however, that suppuration of bone, which either takes place spontaneously, or in consequence of slight external injury, is very frequently followed by caries, much more so than when it results from a wound which does not heal by the first intention ; the reason of which difference probably is, that bone does not readily either inflame or suppurate, but from violence, except in bad constitutions little able to carry on the process requisite for accomplishing a cure.

Generally speaking, caries occurs in persons of a habit naturally weak or unhealthy, or rendered so by improper modes of life, the suppression of some accustomed secretion, or any other circumstance destructive of the balance of action in the system. Much perplexity has arisen from enumerating among the causes of caries, scurvy, gout, rheumatism, &c. If, instead of this, it had been said that caries

is apt to happen in those disordered states of the constitution which give rise to the symptoms of scurvy, gout, or rheumatism, there would have been no difficulty in understanding the operation of these alleged causes.

The treatment of caries is preventive and remedial. The means of prevention are all those which tend to remove the constitutional defects that lead to the production of the disease, together with the use of those agents which counteract deep-seated inflammation, such as the various counter-irritants, from the actual cautery downwards. The actual cautery, though occasionally employed to destroy morbid structures and suppress hemorrhage, has not hitherto, so far as I know, been used in this country to effect counter-irritation. I have used it extensively on the authority of Rust, who, in his treatise on "*Arthro-kakologie oder Verrenkungen durch innere Bedingung*," affirms the most decided facts in its favour, and I hope that so powerful a remedy will soon come into general use.

Though various external applications were formerly thought capable of altering the morbid action of carious bone, and so effecting a cure, I believe all well-informed practitioners now regard the disease as truly incorrigible, and remediable only by destruction of the part concerned. The question, therefore, comes to be, how can this be best accomplished? The means employed are caustics, cauteries, and excision. The first are little used owing to their inefficiency. The actual cautery is a more powerful remedy, and has many friends, but may, I think, be objected to on the grounds,—first, that in most cases

it can hardly be applied to all the affected surface ; secondly, that the extent of its operations is very limited.

Suppose we have to treat a carious joint, where the whole respective surfaces of articulation are diseased, how can the red-hot iron be applied over the whole ? and unless it is applied over the whole, how can the disease be cured, since the cautery extends its effect to a very inconsiderable distance ? But some may deny this last statement, and certainly with the appearance of reason ; since any one would suppose, unless taught by experience to the contrary, that the glowing iron must affect the bone to which it is applied, far and wide, from the part immediately concerned. About ten years ago I saw a surgeon remove an eye, together with a large tumour, from the orbit of a boy aged fourteen, and then apply a succession of full-sized cauteries to the thin orbital plate of the frontal bone. I expected, that, if the patient did not die from inflammation of the brain or its membranes, the whole thickness of the roof of the orbit must exfoliate. But neither of these events took place ; and it was found on dissection, some weeks subsequently, that the bone had been affected to a very slight depth. Having my attention called to the subject by this circumstance, I took every opportunity of observation, and ultimately satisfied myself, that the actual cautery affects a mere film of the bone to which it is applied.

The only other mode of destroying carious bone is excision, which I am convinced is by far the best, since more can be done by the gouge or cutting pliers



in a few seconds, than by the actual cautery in as many weeks or months. In performing the operation, the surgeon ought to expose the bone very freely, and pursue his excision until he feels that he is cutting in sound bone. It is usual to apply the actual cautery after the diseased bone has been cut away; but this proceeding seems very objectionable. If any carious bone remains, the cautery, for reasons already mentioned, will hardly be able to destroy it, at least another scrape with the gouge would be ten times more effectual; and if it is all taken away, as it may and ought to be, what can be more preposterous than irritating anew a weak bone, thereby exposing it to the danger of a relapse?

When the large joints are carious, it is much better to remove the articulating extremities entire, instead of attempting to cut away the diseased surface piecemeal, which in most cases, indeed, would be impossible.

In performing the excision of joints, it ought to be remembered that caries does not affect the bone deeply; and, therefore, that while the surgeon ought most carefully to avoid leaving any of the diseased *surface*, he should give himself little concern as to the thickness of bone which he removes. I think it the more necessary to make this observation, from seeing that Mr Crampton cut away four inches of the humerus, which I should certainly conceive was equally unnecessary and injurious. There is always much effusion of new bone for some distance, generally several inches round the carious portion, and the alteration of appearance thus induced is, I know,

frequently mistaken for a morbid one. It is no more morbid than the callus which unites a fracture, and ought, therefore, to be carefully distinguished. As already stated, the surface presented by caries is excavated, rough, and spicular, such as would result from burning a cellular bone, and then laying open its internal structure. The surface of effused bone, on the contrary, is compact and warty; it looks as if the ossific matter had exuded in a fluid state and congealed into drops; so that, while the carious part resembles a piece of sugar partially *dissolved* by water, the surrounding effusion of new bone has the appearance of sugar partially *melted* by heat.

The excision of joints is usually regarded as a formidable operation, difficult, painful, and dangerous; and, as I observed in relating a case where the shoulder joint was excised, it is not difficult to discover the source of this apprehension. The slightest wounds of healthy joints are known to be frequently productive of the greatest mischief, and hence the proposal to cut them out altogether seems equally rash and frightful. But it ought to be recollected, in the first place, that all the structures which excite so much disturbance by their inflammation, are removed when the joint is excised; and, secondly, that in cases requiring excision the natural structure does not exist, being destroyed by the previous disease. Carious joints, therefore, may be cut into with the same impunity as ordinary abscesses, and cut out with no more danger than what attends amputation, or rather not so much, since the balance of action will be less disturbed, *cæteris paribus*, when

the limb is allowed to remain. As to the additional trouble and pain which may attend excision, they ought surely not to be reckoned of much importance in consideration of saving a limb.

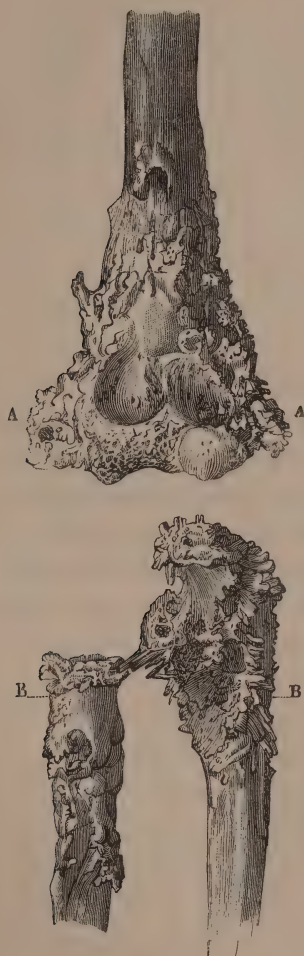
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From this statement it will appear that the great fundamental principle of the operation is, that the obstacle to recovery from the disease lies entirely in the bone, and not in the soft parts, however much they may be altered by suppuration, thickening, or ulceration. Next in importance, is the discrimination between the carious part of the bone, and the effusion of osseous substance in its neighbourhood. In the bones here represented, the whole extent requiring removal is comprehended between the lines A A and B B. From not attending to this circumstance, M. Moreau of Bar-sur-Ornain, who first performed the operation, removed the end of the humerus as high as he felt it rough; and Sir Philip Crampton took away no less than four inches of this bone. It is no wonder that the patient of the latter gentleman, at the end of seven months, could only "give a slight degree of flexion to the forearm,"\* or that such a case should have afforded little encouragement to repeat the operation.

When the operation is to be performed, the patient should be laid on his side, or with his face downwards; so that the posterior surface of the joint may be presented in a convenient position. The incisions

\* Dublin Hospital Reports, Vol. IV.

of Moreau have always seemed to me the best adapted for gaining free access to the joint, with least



injury of the soft parts. They present the form of the letter H. The transverse incision should be

made first, by pushing the knife, a straight bistoury, with its blade towards the ulnar nerve, into the joint, and cutting close to the olecranon, across to the external tuberosity of the humerus. The longitudinal incisions having next been made, the square flaps thus formed are to be reflected upwards and downwards. The olecranon is now so exposed that it may readily be removed by a stroke of the cutting pliers, and thus render the subsequent part of the operation much more easy. The external lateral ligament of the joint being then divided, it becomes easy to press aside the ulnar nerve over the internal tuberosity of the humerus, and divide the internal lateral ligament, after which the extremity of the bone may be grasped in the hand, and divided in a line with the tuberosities by a common amputation saw. The head of the radius then lies quite exposed, so that the cutting pliers, being applied to its neck, at once detaches the head, which alone participates in the disease; and nothing remains but to separate the soft parts, including some of the fibres of the *brachii internus*, so as to insulate what is left of the sigmoid cavity, and allow the saw to remove it in a line with the surface of the decapitated radius. It might seem an easier and simpler process to remove the whole articulating extremity of the ulna at once; but this would not be found so in practice, since the attachment of the *brachii internus* to the coronoid process can hardly be divided so long as the bone remains entire. There is seldom much bleeding, but if any vessels jet they should be tied, to prevent the risk of mischief from distension of the wound. The cut edges should



be carefully stitched together by the interrupted suture, and have some dry lint placed over them. And lastly, the limb being held semi-bent, a roller about six yards in length is to be applied in the figure of 8, to give the requisite support, which it does far more effectually than any sort of rigid case.

If the bones have been removed to a proper extent, so as to extirpate the disease without too much impairing the support of the arm, the process of recovery is quickly accomplished, with hardly any defect in the mobility or strength of the limb. Anchylosis or osseous union never takes place, though at one time alleged to afford the only chance of rendering the hand in any degree useful. The medium of union is always of a tough fibrous consistence, similar to that of the ligamentous texture. This might be inferred from the firmness and moderate degree of mobility, which can hardly be distinguished from that naturally belonging to the joint; and I have ascertained such to be the state of the joint by dissection. The following cases may be taken as examples of the operation, and its results:—

CASE I. — John Currie, aged eighteen, was admitted into the Royal Infirmary on the 13th of June last (1844), on account of disease in his left elbow joint. He stated that, without any assignable cause or perceptible pain, a swelling had commenced about four years before, and that three weeks after noticing it, he had applied to a bone-setter, who treated him very roughly in attempting to reduce a bone which he alleged was dislocated. Though the

swelling increased and became very painful in consequence of this treatment, he submitted to its repetition twice a-week for three months; the joint upon each occasion being subjected to the most violent twisting and bending. At last, finding his complaint getting worse and worse, he applied to another bone-setter, who assured him that the bone had not been out of its place, and that he was the victim of mismanagement. Nothing was then done, and no change worthy of notice occurred until nine months before the time of admission, when a discharge of matter took place spontaneously from the joint. The elbow was much enlarged, and had entirely lost all trace of its proper form; there were several openings from which thin matter issued copiously, and through which a probe could be passed down to carious bone; the patient was much emaciated, and had a very suspicious cough. But as the most careful stethoscopic examination did not detect any evidence of pulmonary disease, it was hoped that relief from the local complaint might restore general health.

On the 28th, I performed the operation in the usual way. The articulating surfaces of all the bones were divested of cartilage and carious. They were exposed in succession, and removed by the saw, which I find preferable to the cutting pliers for this purpose. No bad symptom followed the operation; the wound healed satisfactorily, and the patient very soon began to regain his health; the cough ceased, and the other indications of a phthisical tendency disappeared. He was dismissed on the 14th of August, able to resume his occupation as a "skinner." I saw him lately,

and could not have distinguished the imperfect arm, unless my attention had been directed to it.

CASE II.—Christian Hunter, aged fifty-three, from Kelso, recommended by Dr F. Douglas, was admitted on the 10th of November 1843. She stated that for ten years she had complained occasionally of pain in the right elbow, stretching down to the wrist and hand, and gradually becoming more severe as well as frequent. Nine months before the time of her admission, the joint swelled to a great size, and the pain, which was then incessant, suffered so much aggravation by the slightest movement, that she was obliged to keep the limb entirely at rest. An opening was made soon afterwards with the effect of discharging a large quantity of matter, and affording relief from the pain. The disease then remained stationary.

On examination, the elbow was found considerably swelled, and scarcely moveable. It could not be extended beyond a right angle, or bent, except very slightly; and the arm was almost powerless. A sinus on the outer side of the joint allowed a probe to enter the articulation. I performed the operation on the 15th of November, cutting out the articulating extremities of all the bones, which were completely carious. The soft parts being unusually sound, healed quickly; indeed, almost entirely by the first intention, so that the patient was dismissed quite well on the 18th of December. I heard soon afterwards from Dr Douglas, that on calling to see how she was doing, he had found her knitting stockings, in good health, and free from any uneasiness.

CASE III.—In November 1844, I was asked to see a lady with Dr Thatcher and Dr John Brown, on account of disease in the right elbow joint. She was about forty years of age, very thin and exhausted-looking, with every appearance of speedy sinking after protracted illness. It appeared that she had been suffering severely, for more than two years, from ulceration of the articular cartilages, which had terminated in suppuration and caries. There were sinuses of eighteen months standing, through which a probe could be passed in different directions into the cancellated texture, and the bones composing the joint admitted freely of lateral movement. It was obvious that the patient could not much longer endure the constant drain upon her strength ; but any operation was thought quite out of the question in her weak condition, which indeed seemed so extreme as to render unsafe even any allusion to such a proceeding.

About a month afterwards I again saw this lady, and then, with the sanction of her other medical friends, ventured to propose removal of the diseased bone. She consented to the operation, which was performed as usual, so as to excise the whole articulating extremities of all the bones composing the joint. She bore it well, and, before the end of another month, was able to employ the hand of the arm affected for knitting. She has since enjoyed perfectly good health, and had an addition to her family.

CASE IV.—James Tainsh, aged eight, from Stirling, was admitted on the 26th of May 1836. He had hurt

his elbow by falling on it in the month of December before, since which time the motion of the joint had become gradually impaired, abscesses had formed, and large ulcers opened leading down to the bone. I cut out the joint on the 31st, in the usual way. The patient suffered so little disturbance from the operation, that he could be with difficulty confined to bed; and in two or three days was going about as if nothing had happened. He went home on the 25th of June.

CASE V.—Boaz Simpson, aged thirteen, was admitted on the 29th of May 1833, on account of a diseased elbow joint. It was very much enlarged, stiff, and discoloured. Various sinuses, opening at different parts of the limb, led down to the bones. The arm both above and below the elbow was extremely emaciated. The patient was of very small growth, and had a short dry cough; but took his food well, and was in other respects healthy. It was stated, that the disease had commenced between three and four years before, with the formation of an abscess, independently, so far as could be learned, of any external violence, and had advanced progressively notwithstanding every attention.

It was evident that recourse must be had either to excision or amputation, and though the patient certainly did not seem a favourable subject for either, or indeed for any operation, the former did not appear to be attended with more danger than the latter, while the preservation of the limb was evidently a most important object.



The operation was performed on the 7th of June in the usual way. The whole of the articulating surfaces were removed. The patient suffered hardly any constitutional disturbance, and on the third day was allowed to sit up. The discharge in a few days almost ceased; and in the course of a fortnight he could use the arm a little. He was detained in the hospital until the 5th of August, in order that his progress to complete recovery might be observed; but he might have been dismissed much sooner, as for several weeks there had been merely a few drops of serous discharge daily.

CASE VI.—James Topings, æt. seventeen, Shotts, admitted August 17th, 1833.—The elbow was enlarged, and admitted of very little motion. A sinus over the internal tuberosity of the humerus, allowed a probe to reach the bone and enter into the joint. The disease had existed upwards of twelve months, and was becoming progressively aggravated. The articulation was excised in the usual manner on the 1st of September. No bad consequences followed; and the patient was dismissed on the 22d October. He returned some weeks afterwards to show how well he was, there being no discharge from the wound, and the arm being not only moveable, but already under the voluntary command of the muscles.

CASE VII.—David Forret, æt. twenty-eight, from Cupar-Fife, recommended by Dr Scott of Cupar, was admitted into the Surgical hospital, July 1830, on account of a diseased elbow joint, of which he gave

the following account : “ Nine months ago he began to be troubled with a gnawing pain at the back of his right elbow, as if between the ulna and humerus. There was then no swelling ; the motion of the joint was somewhat impeded, but did not increase the pain. In January, he observed a small tumour, about the size of a bean, a little above the internal condyle, which broke two weeks afterwards, and has continued to discharge ever since. Up to this time he had not been incapacitated from working, the pain which he felt being only moderate, and ascribed to rheumatism. But four months ago, without sustaining any injury, the joint inflamed, becoming red, swelled, and excessively painful, so as to render the slightest motion intolerable. He was blooded and leeches repeatedly, by which means the activity of the disease was subdued, and, shortly afterwards, another opening made its appearance on the outside of the olecranon. The constant discharge, gnawing pain, stiffness of the joint, and general exhaustion consequent on this severe and protracted disease, have made him extremely anxious to obtain relief, and willing to submit to any measures necessary to afford it. He is thin, pale, and evidently much reduced by his sufferings.”

This case evidently required either excision or amputation. My friend Mr Webster, Surgeon of the 4th Dragoon Guards, who saw the patient on his admission, and who had not at that time witnessed the operation of excision, declared that he would have no hesitation in amputating the arm. Though there was evidently very extensive disease of all the soft parts, I did not consider this any objection to

excision, and, accordingly, performed the operation in the usual manner, that is, by making a transverse incision from the ulnar nerve to the external tuberosity of the humerus, close to the olecranon, and then one upwards and downwards at both of its extremities. All the bones entering into the articulation were very much diseased, the cartilage being abraded and the surface carious. The synovial membrane, being very much thickened and gelatinous, was cut away as far as possible, one small artery of the integuments was tied, and the edges of the transverse incision were stitched together; but the extreme softness of the diseased integuments rendered it impossible to close the longitudinal ones in this way, as the threads instantly cut their way out. Lint and a bandage were then applied.

The patient has done extremely well; the swelling of the joint is now almost gone; the discharge has almost entirely ceased; and he has the prospect of being soon dismissed cured.

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The following letter, received from this patient three years after the operation was performed, will show that the favourable anticipations just expressed were fully realized.

*Cupar-Fife, 5th August 1833.*

WORTHY SIR,—I take this opportunity of again expressing my gratitude towards you, and to let you know to what perfection my arm has arrived since you operated upon it in 1830, July 15th. I wrote

to you as I promised as soon as I could hold the pen, as you know it is my right arm, and with it the office of writing is performed. I think it was about the 5th December 1830, when I wrote you that it was almost whole, but very weak.

I have now to state to you what I have been employed at for nearly this two years, and how my arm performs its duties. I commenced grocer and spirit dealer in this burgh about two years ago, and I find my arm quite sufficient for this business. I can carry eighteen or twenty pounds with ease, put six or eight pounds up to my head with it, make out accounts, &c., so that no person would know whether I had my elbow joint or wanted it. I have even asked some people if they thought there was any thing the matter with my right arm, to which they answered they could discover nothing. I most certainly think the case of my arm a very wonderful one, on account of the great strength and flexibility it has gained. If you had not operated upon it I could not have expected to live long, as my health was very much impaired before I applied to you. But Divine Providence has ordered it otherwise. I am now enjoying as good a state of health as ever I did. Accept of my most grateful thanks; and may Heaven bless you for all your kindness and humanity towards me.—I am, Worthy Sir, your obliged and humble servant, DAVID FORRET.

I could add dozens of cases equally confirmatory of the advantages attending this operation, but trust that what has been said will be considered sufficient,

and lead to a more general adoption of so manifest an improvement. While this sheet is passing through the press, a lady from the west country has applied to me for relief from disease of the elbow joint most suitable for excision, but for which an hospital surgeon had assured her amputation was necessary.



## ARTICLE XIX.

## ON EXCISION OF THE UPPER JAW.

THE great advantages derived from removing tumours of the lower jaw by cutting through the sound bone, completely beyond the limits of morbid growth, instead of vainly attempting to extirpate the disease, by digging it out from the centre towards the circumference, naturally suggested the adoption of a similar mode of procedure with regard to the upper jaw. But the firm and complicated connexions of this bone, together with its important share in constituting the mouth, nose, and orbit, and also the large blood-vessels distributed about it, presented such formidable obstacles to removal, that up to the year 1829 there was no instance on record of this operation having been performed. In that year I met with a case which seemed favourable for the purpose, and though it proved to be not so, from the disease extending beyond the maxillary bone, I proved, by the operation, the practicability of removing the upper jaw, and established a plan of

proceeding, which, without any alteration except as to the subordinate details, has since been adopted by the profession.

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[FROM THE EDINBURGH MEDICAL AND SURGICAL JOURNAL, 1829.]

*Superior Maxillary Bone Excised.* By JAMES SYME, Esq., Surgeon of the Surgical Hospital, and Lecturer on Surgery in Edinburgh. [Addressed to the late Dr DUNCAN.]

MY DEAR SIR,

YOU are aware that Osteo-sarcoma of the upper jaw bone is a complaint not very uncommon, and that its result has been hitherto uniformly fatal, whether the disease was allowed to follow its own course, or attempts were made to arrest it by digging out the morbid growth. Surgery, in short, has not been more successful in this case than it was in regard to the same malady affecting the lower jaw, so long as its operations went no further than the confines of the tumour. I need not remind you with what ease and certainty osteo-sarcomatous tumours of the lower jaw are now removed on a different principle, viz. cutting through the sound bone; and there can be little doubt that similar growths of the upper jaw would be removed with equal advantage, provided they could be extirpated by excision of the whole bone affected. Attempts have accordingly been made to accomplish this amputation of the superior maxilla, but have hitherto failed, chiefly owing to the uncontrollable hemorrhage which I have

heard obliged one operator to desist even after he had tied both carotids. A case lately occurred in which I overcame this difficulty; and as the plan of operation followed on the occasion in question seems to me such as renders the process very easy and safe, I think the readers of your Journal may consider it deserving of their attention.

William M'Donald, æt. fifty-four, recommended by my friend Mr Davidson of Dundee, entered the Surgical Hospital on the 11th of May, on account of a large swelling of the left cheek. The tumour was about the size of a turkey's egg, firm, projecting, and circumscribed. It seemed to occupy all the maxillary bone, extending into the mouth, but not passing beyond the mesial plane of the palate, and reaching up to the lower edge of the orbit. It had existed ten months, and was increasing. In these circumstances Dr Ballingall and Mr Nasmyth agreed with me in thinking that the patient's speedy destruction was inevitable if the disease were left to itself; that an attempt to dig out the tumour would be inflicting pain without the smallest prospect of permanent benefit; and that the case was a very fair one for practising excision of the entire superior maxillary bone.

In the presence of the gentlemen above mentioned, and the pupils attending the hospital, I proceeded to do so on Friday the 15th.

The patient being seated on a chair, I made a crucial incision by cutting from the zygoma to the angle of the mouth, and from the inner angle of the eye to the angle of the jaw. Having dissected back

the flaps thus formed, so as to bring the external surface of the tumour completely into view, and tied the facial artery, together with two transverse facial branches of the temporal, I partially divided the malar bone with a saw, and completed its section by means of the cutting pliers. I then, partly by dissection, partly by pushing with the handle of the knife, separated the contents of the orbit from the floor of that cavity; next placing one blade of the cutting pliers in the nose, the other in the orbit, divided the nasal process of the maxillary bone; and, lastly, cut through the hard palate in a similar way, having previously extracted one of the incisor teeth.

So far I had calculated that the operation would be nearly bloodless; but to prevent troublesome hemorrhage in executing what remained, it seemed to me proper to get command of the internal maxillary artery. In order to do this, I made a small incision below the ear, and dissected through the parotid gland, to as to enable Dr Ballingall to compress the vessel between the point of his finger and the neck of the lower jaw. I then readily and fearlessly turned out the tumour; and we were pleased to see that the artery was as effectually controlled as the femoral ever is by the best applied tourniquet. We were less pleased to observe that the morbid growth was not confined to the maxillary bone, but extended to the sphenoid, in the base of the skull.

Having done all that we proposed, and all that could be done, we determined to try nothing more. I therefore brought the edges of the cheek together by sutures, and sent the patient to bed.

The patient suffered no constitutional disturbance, and was walking in the garden on the third day after the operation.

Though there is still no appearance of the disease recurring, there can be little doubt that the result will be no exception to the usual one of such cases; but knowledge of the facts that the inferior maxillary bone may be completely excised—and that the hemorrhage of the internal maxillary artery may be effectually restrained by pressing the vessel at its origin upon the neck of the jaw—may be useful in future, by inducing surgeons to practise excision while the disease remains within accessible limits.

I remain, my dear Sir, very faithfully yours,

JAMES SYME.

*75, George Street, 16th June 1829.*

In 1830, M. Gensoul of Lyons published a treatise on removal of the upper jaw, and soon afterwards honoured Edinburgh with a visit, when I had the pleasure of seeing several tumours on which he had successfully operated. He employed a chisel and mallet for detaching the osseous connexions, but did not convince me that these means were preferable to the more simple and efficient agency of the cutting pliers. I consider it now unnecessary to reprint any of the particular cases in which I have performed the operation; but may offer some remarks upon the diagnosis of cases proper for its employment, and also upon the mode of execution most conducive to a satisfactory result.

The tumours of the upper jaw which require its



removal, originate from the substance of the bone, and do not extend their roots beyond its limits. The firmer the consistence of these textures is ascertained to be, the more confidently may permanent benefit be expected from the operation.

The tumours of the upper jaw for which removal of the bone is not proper, are, 1. those that grow from the gum, or alveolar region, and have not extended their roots beyond these limits; 2. those of a malignant kind, which originate from or extend to the base of the cranium; 3. Cysts containing serous fluid, developed within the substance of the bone, and existing either independently or in connexion with teeth remaining latent in the jaw; 4. abscesses of the maxillary antrum.

It is more especially with regard to the second and third of these conditions that caution must be exercised in avoiding the operation, since it could not afford complete or permanent relief from the former; and is altogether unwarrantable for the latter, which admit of effectual remedy on much easier terms. In malignant cases suspicion may be excited by the soft consistence and rapid growth of the tumour, and by the unhealthy aspect of the patient. But one or more of the following circumstances should be held as an insuperable objection to operating.—These are, 1. Enlargement at the root of the nose; 2. Obstruction of the nostril on the affected side, especially if it has appeared at an early stage of the disease, and is attended with the appearance of a polypus in the cavity; 3. Displacement of the eyeball outwards or forwards.

The cysts which are formed within the maxillary

bone, usually have an osseous covering over the greater part of their extent, which is apt to suggest the belief of their being solid tumours; but, when carefully examined, is found at some points to be either deficient or so thin that it yields under the pressure of a finger, as if composed of thick paper or parchment. This thin portion of the parietes is generally seated either in the front over the gum, or in the palate. The remedy required is a free drain for the fluid, and may be formed either by cutting from within the mouth, or by elevating the cheek, and making an opening between it and the gum. If there is room for selection the latter position is preferable, and, to prevent any risk of the aperture closing, a small elliptical portion of the membranous or osseous parietes should be cut out.

In performing the operation, the first object is to expose the bone sufficiently for allowing its connexions to be divided. For this purpose, an incision through the cheek from the malar prominence to the angle of the mouth, slightly curved, with the convexity downwards, will be found the most convenient mode of dividing the integuments, as it affords ample space, and, when healed, may have any trace which it leaves concealed by the whisker of the patient, if a male, or the string of a cap, if the subject of operation be a female. The osseous attachments should be divided in the following order—1. the malar; 2. the nasal; 3. those of the palate. The malar bone may be either detached entire along with the superior maxillary, by separating its connexions with the frontal and temporal bones, or divided through its body

from the margin of the orbit downwards. The latter mode is equally effectual in removing the disease, and has the advantage of causing much less alteration of the patient's countenance. It may be easily accomplished by making a notch with the saw, and then applying the cutting pliers.

The operation, when thus performed, and by a single incision, is wonderfully simple when compared with the complicated procedure of those who detach the malar bone from its frontal and temporal connexions, and cut through the cheek in four or five different directions. The hemorrhage is very considerable, and, so far from warranting ligature of the carotids, does not even require pressure on the internal maxillary artery, as in the first instance I believed to be necessary.

## ARTICLE XX.

## ON LIGATURE OF THE CAROTID ARTERY.

[FROM THE EDINBURGH MEDICAL AND SURGICAL JOURNAL, 1835.]

CASE I.—*Carotid Aneurism*.—Thomas Blair, aged forty-three, farm-servant, was admitted on the 10th of February 1835. He stated, that, seven weeks before this time, he had been struck down by a horse, behind which he was standing, and was found by his friends lying insensible. It appeared that the shoe had cut his face over the malar projection, and that the point of it, which was very large and thick, had inflicted a blow on the throat a little below the angle of the jaw on the right side. He soon recovered his consciousness, and complained of great pain throughout the injured side of his head and neck, which was much swelled. In the course of ten days the swelling of his face subsided, but that of the neck rather increased, and became more painful; and, as his sufferings seemed constantly becoming more severe, he had been sent to be under my care in the hospital.

The hollow at the upper part of the neck was

occupied by a tense swelling, which was felt to be distended in every part at each pulsation of the heart. The patient kept his head bent forward to the right side, and seemed very apprehensive of any alteration in this position. He complained of intense pain in the right side of the head. The right eye appeared nearly a half smaller than the other, and the whole of the face on the same side had an immoveable sort of appearance, as if paralysed. The tongue was protruded with difficulty, and, when withdrawn, was evidently moved by the action of the left half alone, the other being quite passive, and merely following the contracted part; but both sides received the impression of taste. The voice was almost entirely lost, and replaced by a rough croaking whisper. From these circumstances, it was concluded that an aneurism of the common carotid artery had resulted from the blow, and caused pressure on the nerves at the root of the neck.

The common carotid was tied on the 18th. The operation was difficult, from the thickness of the patient's neck, the distension caused by the aneurism, and the unfavourable posture in which the head was maintained. The *omo-hyoideus* having been exposed, and pulled a little downwards, the sheath of the vessels was opened on its tracheal side by lifting up a fold with the forceps, and cutting it with the knife. The artery being thus rendered quite bare for a small extent, without any other disturbance to its position or connexions, a strong silk thread was passed round it by the simple curved needle, and tied as tightly as possible. *The patient was instantly*



*relieved from the pain, and never had any return of it.* Not the slightest unpleasant symptom followed the operation. The swelling ceased to pulsate, and gradually diminished; the countenance acquired a more natural expression; the different parts which had been paralysed regained their mobility; and, lastly, the voice returned. The ligature came away on the 11th of March. The patient's strength having been very much reduced, was slowly regained; but he went home on the 14th April, and is now well.

This case seems interesting from the mode of its origin, the symptoms attending it, and also the circumstance of its being the first instance of carotid aneurism operated on in Edinburgh.

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[FROM THE LONDON AND EDINBURGH MONTHLY JOURNAL, 1842.]

CASE II.—*External Aneurism of the Internal Carotid Artery.*—In the early part of last April, I was requested by Sir William Newbigging to meet him and Dr Abercrombie in consultation, on the case of a lady about sixty years of age. She was rather tall and very thin, with the general appearance of feebleness. Her complaint was a tumour of the throat, in the situation of abscess connected with the tonsil. It was first noticed in the month of November preceding, after more than usual suffering from a dry hard cough, which had existed with little interruption for five or six years. The swelling, at first very small, gradually increased, and at length occupied the fauces so as to interfere with deglutition, and

occasion uneasy feelings of distension by its bulk, which fully equalled that of a large walnut. It was not circumscribed in appearance, presenting, indeed, the diffused aspect of a purulent collection; but when examined by the finger, was felt more distinctly limited than an abscess of the part. At the same time, its contents were found to fluctuate throughout their whole extent, and a strong uniformly distending pulsation could be perceived over every accessible part of the tumour.

There could be no doubt as to the nature of the case, and as little in regard to its result, if effectual means were not taken to arrest the progress of the disease. It was plain that an aneurism had been formed in the course of the internal carotid artery, between its origin from the common trunk and entrance into the cranium. And it was no less obvious, considering the progressive enlargement, together with the continued excitement from coughing, that the swelling, if permitted to increase, must soon encroach on the pharynx, so as to impede deglutition altogether, or cause suffocation, unless the sac should ulcerate, and terminate the patient's sufferings by hemorrhage at an earlier period. We therefore decided upon recommending that the common carotid should be tied; and, meeting with no objection on the part of the lady or her friends, agreed to perform the operation on the following day.

In presence of the gentlemen above mentioned, together with Drs Patrick Newbigging and Mackenzie, I cut down upon the vessel, and tied it with

a single silk ligature, just below the crossing of the *omo-hyoideus* ; no difficulty whatever was experienced in effecting this, hardly a tea-spoonful of blood escaped, and the patient walked to an adjoining bed-room without appearing to suffer or to have suffered almost any disturbance. During the day she complained of pain in the back of her neck near the occipital region, and struck me as looking even more pale than she had done previously ; the pulsation of the tumour still continued, but was much less forcible. In the evening a draught containing the solution of muriate of morphia was prescribed, to be taken in the event of restlessness, but which, not proving requisite, was withheld.

Next morning, about six o'clock, I was informed that the patient had all at once been seized with nearly incessant vomiting and discharge from the bowels. On visiting her, I found all the signs of approaching dissolution, the weakness being extreme, the features bloodless, sunk, and altered in expression, and the pulse small, feeble, and irregular. The evacuation of greenish watery fluid both upwards and downwards still continued, though not so frequent as at first. Notwithstanding the use of stimulants, no improvement took place, and she expired about six o'clock in the evening, thirty hours after the operation.

The parts concerned were examined in presence of the gentlemen who had witnessed the operation, with the exception of Dr Abercrombie, who was otherwise engaged, and with the addition of Mr Goodsir, who assisted me on the occasion, and afterwards dissected the preparation. The artery was found to be tied just

as could have been desired, without any disturbance of the vein, nerves, or neighbouring textures. It was traced upwards to the bifurcation, immediately beyond which the internal carotid dilated into an aneurismal sac. We then opened the head to ascertain if the disease extended within the cranium, but discovered nothing in the state of the vessels at all abnormal. The lower jaw was next divided, so as to afford free access to the tumour, which, being exposed up to the base of the skull, allowed us to see that the artery, before entering the carotid canal, regained its usual characters. I cut it across there, and detached the whole extent of the vessel down to the root of the neck.

It appeared upon careful examination, that a crevice nearly half an inch in length had been formed through the inner coats, in the upper or anterior surface of the internal carotid, about midway between its origin from the common trunk and entrance into the cranium; that the external coat had expanded so as to form the sac of the aneurism, and that the pressure caused by the tumour, had distorted the course of the vessel, and given it a sigmoid direction. The contents of the sac were coagulated, except in a narrow channel corresponding with the current through the artery, which, it may hence be inferred, had not been completely arrested. Indeed, this was not and could not reasonably be expected, when the free retrograde passage afforded by the anastomosing communications of the external carotid was taken into account.

The result of this case was not less unexpected

than distressing. I had repeatedly tied the carotid, and never met with the slightest bad consequence from the operation. The patient, though thin and fragile-looking, seemed free from any organic disease besides the aneurism, and possessed in a remarkable degree that composed disposition of mind which is so favourable to recovery from injuries. The artery was tied with more than usual facility, and with the most perfect insulation that could be desired. Though doubts might be entertained as to the cure of the disease, through want of sufficient obstruction to the flow of blood, no apprehension was entertained of danger from the operation, and I feel quite unable to offer any satisfactory explanation of its fatal issue.

In a pathological view the case is interesting, from presenting an example of aneurism in a very unusual situation. The branches of the carotid artery within the cranium occasionally open into aneurismal sacs, which are apt, by their bursting, to cause sudden death from hemorrhage. But a well-ascertained aneurism of the internal carotid artery, exterior to the cranium, does not seem to have been hitherto recorded.

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[FROM THE EDINBURGH MEDICAL AND SURGICAL JOURNAL, 1833.]

CASE III.—*Ligature of the Carotid Artery on account of Hemorrhage from the Ear and Fauces.*—Though this case was not treated in the hospital, it deserves to be related from the unusual circumstances with which it was attended. I am indebted



to Mr Cheyne of Leith for the following history of it:—

“ William Mason, a delicate boy, nine years of age, complained in the latter end of August 1832 of a soreness in the left *fauces*. This ceased in two days. About a week afterwards, viz. on the 29th August, he was seized with pain and swelling of the right *fauces*, and smart accompanying fever. The fever left him in a day or two, but there remained a painful external swelling situated between the upper part of the larynx and the mastoid muscle. This increased gradually, extending upwards to the jaw, and finally to the tube of the external ear.

“ On the night of the 8th September a discharge of pus took place from the *meatus externus* of the ear, and it continued till the following evening. A tea-cupful probably was the quantity altogether discharged. The latter portions were tinged with blood. Soon after the discharge of pus had ceased, the ear having been lightly bound up, the boy raised an alarm in consequence of a flow of blood from the ear. Upon removing the bandage it continued profuse for a short time. It then ceased. Some ounces appeared to have been lost. A compress and bandage were applied. The swelling dependent on the abscess had disappeared entirely.

“ 13th.—A fresh bleeding from the ear. Sponge introduced, with compress and bandage over it. Since the 9th (the date of the first bleeding), a swelling has been formed between the angle of the jaw, mastoid process, and external tube of the ear; it has no pulsation.

“16th.—The swelling considerably increased ; it now extends downwards, bordering on the *larynx*. On examining the mouth, a swelling is perceived like that produced by an enlarged tonsil pushing forward the anterior curtain of the palate, and insinuating itself between the jaw and lining membrane of the mouth : it is rather pale in colour, soft, and elastic. The following symptoms are present : considerable difficulty of breathing and swallowing, imperfect articulation, frequent hawking of phlegm from the throat, difficulty of closing the jaws, difficulty of lying down, very uneasy expression of the countenance, with constant watering of the eyes. The pulse of the temporal artery to be distinctly felt.

“18th.—In the evening he discharged suddenly from the mouth two or three ounces of florid blood. For a day or two before this the phlegm from his throat had been tinged with blood. The case appearing to be one of extreme hazard, and the object of present apprehension, hemorrhage, likely to be fatal, either by its quantity or through the vicinity of the *trachea* by causing suffocation, it was suggested by Dr Combe to tie the common carotid artery, and this operation was proposed to the parents. They, however, did not accede to it at that time. It was then agreed to request Mr Syme’s opinion on the case. Mr S. having approved of the measure, it was again recommended (by him) to the parents, who now consented to it. The artery was then tied at the side of the larynx by Mr Syme.

“October 1st.—Immediately after the operation an improvement in all respects took place, and has been

gradually increasing till to-day. The operation itself gave rise to no inconvenience which would not have resulted from a simple wound of the parts. The external swelling decreased quickly, and is now gone. There still remains a slight internal swelling in the situation of the tonsil. No pulsation of the temporal artery. Since the first bleeding at the ear, there has always been an oozing from it of a thin bloody ichor.

“On the evening of this day, while he was reading aloud, a profuse bleeding took place from the internal *fauces*, and at the same time from the ear. It soon ceased. About ten ounces were discharged in all. On examining the mouth some clotted blood was seen adhering to the right tonsil. He had been allowed incautiously to go out of doors in the forenoon, and had run about without restraint.

“2d.—A tumour equal in size to the half of a hen’s egg has been formed since last evening between the angle of the jaw, mastoid process, and tube of the ear. There is no increase of the swelling in the mouth.

“6th.—The external swelling decreased in some degree. There has been no discharge of the ichorous fluid from the ear since the 1st inst.

“In the evening a fresh discharge of blood from the internal *fauces* and nostrils (from one source, however, the right side of the *fauces* as it appeared). It soon ceased, but not before about twenty ounces were lost. Immediately after he had syncope. In two hours he had rallied, and was asleep with a pulse at 120.

“8th.—In the evening, a bleeding from the *fauces*

to the amount of eighteen ounces, followed by faintness and very small pulse.

“ After the 8th there was no return of bleeding, the swelling decreased, and he gradually recovered. For some time the right tonsil appeared of a dark colour.

“ He is now as well as before the commencement of his illness.

“ *December 14, 1832.*”

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As this case, together with others of hemorrhage under similar circumstances, has been referred to in support of the opinion, that an abscess may be converted into an aneurism by ulceration of a contiguous arterial trunk, I think it right to remark, that although arteries frequently open on the surfaces of sinuses and ulcerated cavities, the only instance of communication with an abscess on record, is the one supposed to have occurred in University College Hospital. In a practical point of view, the question is of little consequence, since the aneurism, resulting from conversion of an abscess, would require the same diagnosis and treatment as if it had possessed an aneurismal constitution from the beginning.

## ARTICLE XXI.

## ON DISLOCATION OF THE SHOULDER AND HIP JOINT.

[FROM THE LONDON AND EDINBURGH MONTHLY JOURNAL OF MEDICAL  
SCIENCE, APRIL 1845.]

CASE I.—*Dislocation of the Shoulder Joint of seven weeks standing—Reduction.*—Euphemia Steele, aged fifty-five, was admitted on the 25th of December 1844, with dislocation of the left shoulder joint. It appeared, that on the 5th of November she had fallen upon her side, and in consequence suffered much from pain of the left arm ;—that she had been under surgical treatment from the 13th to the 27th, for a bruise on the elbow ;—and that at the latter date, as there was nothing perceptibly wrong with the elbow, her continued complaint of pain from the shoulder downwards was discredited, while a flattening noticed under the acromion, was attributed to emaciation of the limb from want of exercise. A month having afterwards elapsed without any improvement, the patient applied at the Minto House Dispensary, and being there found to labour under dislocation of the shoulder, was placed under my care in the hospital.

On the 26th, after immersion in the warm bath



for an hour, reduction was attempted by extending the arm above the elbow in a line with the trunk ; but though the head of the bone, which lay forwards on the inner side of the coracoid process, was made to move considerably towards the socket, it could not be fairly replaced. Two days afterwards, another attempt proved more effectual. I this time, as before, laid the patient upon her back on a table—secured a hair cushion in the axilla by means of a stuffed leather belt fastened to a ring in the wall, and then extended the arm by pulleys acting upon a skein of worsted attached by the “clove hitch” to the wrist, instead of the arm above the elbow. My reason for this alteration was, that during the former trial I had remarked the integuments of the arm and shoulder to be extremely tense, and hence concluded that the force might be more efficient if it were to act upon a more distant part of the limb. In accordance with this expectation it was immediately perceived that the bone yielded much more readily than it had done on the previous day ; and, without any snap being heard or felt, the patient soon exclaimed that her shoulder was right. On examination it was found to be so, though the slightest movement of the arm in the way of abduction, caused the bone to quit its place, into which, however, it could be easily returned again by slight pressure of the fingers in the axilla. A bandage, applied so as to confine the elbow close to the side, kept the joint secure until its natural connexions were sufficiently restored to prevent any risk of displacement, and the patient was discharged on the 18th January.

CASE II.—*Dislocation of the Shoulder Joint of seven weeks standing—Reduction.*—William Stewart, aged fifty-six, was admitted on the 3d December 1840, seven weeks after sustaining a dislocation of the right shoulder joint, for which he had been treated in the country by a bone-doctor, as suffering merely from the bruise occasioned by a fall on his side. After having been an hour in the bath, he was laid horizontally, and subjected to extension by means of the pulleys, in the direction of the long axis of the body. The bone regained its place without any snap, but escaped on the extension being discontinued; and therefore, when again reduced, was secured by a bandage confining the arm to the side.

CASE III.—*Dislocation of the Shoulder Joint of four weeks standing—Reduction.*—James Grieve, aged fifty, was admitted on the 2d of January 1844, four weeks after having his left shoulder joint dislocated. He had been under the care of a surgeon, who had tried to reduce the bone, and assured him he had done so, though no relief or alteration in his feelings was afforded. He was immediately subjected to the pulleys\*—without success; but next day, after being an hour in the bath, had the bone restored to its place.

CASE IV.—*Dislocation of the Shoulder Joint of four weeks standing—Reduction.*—Elizabeth Gair, aged fifty-three, was admitted on the 30th of November 1844. She stated, that on the fourth of the same month she had fallen on her right elbow; that a surgeon to whom she immediately afterwards applied,

told her the shoulder joint was dislocated, and tried to reduce it by means of his heel in the axilla; and that then (experiencing no relief, though assured the bone was replaced) she had recourse to a "*bone-setter*," who made an attempt which did not prove more successful. On the 2d of December, after being in the warm bath, the patient was laid upon a table, with a hair cushion secured in her axilla. Extension was then made from above the elbow by pulleys, and the bone very soon returned into its socket, with a distinct snap. As abduction of the arm was found to cause renewal of the displacement, I bandaged the limb as usual to the side.

The means employed for reducing dislocation of the Shoulder joint, should be varied according to circumstances, especially the period of its duration. Within a few hours after the injury, I have repeatedly effected reduction without any assistance, by placing one hand on the acromion, and then, having bent the fore-arm to a right angle, suddenly drawing the elbow backwards, so as at the same time to rotate the hand outwards.

The effect of this movement is well illustrated by a case which lately fell under my notice. The patient came from the country, a distance of twelve miles, for the purpose of having a dislocation of the shoulder reduced. Seeing, from the position and powerless appearance of the arm, that the bone was displaced; and having felt, by putting my arm under his clothes, that its head lay in the axilla, I desired him to take off his coat. No sooner had this, with

some assistance, been accomplished, than he declared that he felt his shoulder quite right, which it really was, no doubt from the action required for withdrawing his arm from the sleeve.

In ordinary cases, of a few hours to as many days' duration, the most convenient method is to seat the patient upon a chair, and pull the arm at a right angle with the chest. If the resistance cannot be readily overcome in this way, it may be warrantable to employ the rude but powerful means of extending by the hand against the heel in the axilla. In a dislocation of two weeks standing, which had been previously subjected, without success, to several very forcible attempts, I accomplished reduction almost instantaneously, by desiring one of my pupils to place his foot in the patient's axilla, and pull his hand. When, from the lapse of time, a still greater degree of difficulty is to be anticipated, the assistance of pulleys becomes proper, together with the use of some means to lessen the force of muscular contraction. For this purpose, tartar emetic, bleeding, and the warm bath, are generally employed. In the earlier part of my practice, I generally combined the effects of these nauseating and depressing influences; but the one last mentioned seems to be quite sufficient of itself; and being not unpleasant to the patient, either at the time or afterwards, the others had better be omitted. From the various directions in extending the arm, which have been adopted by different practitioners, it might seem as if the degree of force were of more consequence than the line of its operation; while the truth, I believe, is,

that success depends very much upon the limb being held during the extension near the side of the body, so as to relax the pectoral and dorsal muscles, which constitute the margin of the axillary hollow. Hence the success attending the plan of pulling against the heel in the axilla; and hence the propriety of extending in a line with the trunk, when the amount of difficulty anticipated suggests the sacrifice of convenience for efficiency. The extending power may act either on the arm above the elbow, or on the wrist. The former situation allows the fore-arm to be used as a lever for causing rotation, but exposes the integuments and muscles to compression, which must always be opposed to the object in view; and, as in the case above related, may prevent it from being attained.

In dislocation of the hip joint, the extending force may act either upon the ankle or above the knee; but as rotation of the limb very considerably conduces to replacement, and as this movement is best effected by means of the leg used for a lever while the knee is bent, the preference should be given to extension from above the knee. It may be added, that the extensors of the hip, being flexors of the knee, are put very much upon the stretch if the knee is kept straight, while the limb is extended, as it ought to be, in the direction which the thigh bone assumes in this form of dislocation.

CASE V.—*Dislocation of the Hip Joint of five weeks standing—Reduction.*—James Millar, aged forty, was admitted on the 23d of January, five weeks



after being overwhelmed by a fall of earth while his legs were crossed. The left limb was nearly two inches shorter than the right one, and in all other respects exhibited very distinctly the characters of dislocation of the hip joint on the *dorsum ilii*. Next day, after the usual preparation in the warm bath, he was subjected to extension from the ankle without success, the lever afforded by the foot for causing rotation being obviously very inefficient, and the muscles on the back part of the thigh feeling extremely tense. The pulleys were then made to act above the knee, and speedily restored the bone to its place.

CASE VI.—*Dislocation of the Thigh Bone on the Dorsum Ilii, of nine weeks standing—Reduction.*—William Scott, aged thirty-six, a mason in Dunfermline, fell while walking on the road, from his foot becoming fixed in a cart track, and dislocated his left thigh bone upwards. He applied to a bone-setter in the neighbourhood, and also to a regular practitioner, who attempted without success to effect reduction. He then proceeded to a famous bone-doctor near Perth, who told him that the injury, having existed so long, nearly five weeks, could not be remedied. He returned home, and spent another month in hopeless lameness, when Mr Dewar happened to see him, and recommended his case to my care.

The patient possessed a strong muscular frame, and the bone had become very moveable in its new position. So far the circumstances were unfavourable, and rendered the prospect of success still less promising than it appeared to be, from nearly nine

weeks having elapsed since the accident happened. It being still considered right to make an attempt, the day after his admission, on the 6th of December, the patient, after losing sixteen ounces of blood from the arm, was put into the warm bath for an hour. He was then carried into the theatre, and took at intervals a solution, containing four grains of tartrate of antimony. He lay upon his right side, with a mattress between him and the floor. A hair cushion was placed in the perineum, over which and obliquely round the pelvis a broad canvass band was passed, and fastened to a ring in the wall. A skein of worsted being then secured to the thigh immediately above the knee by the *clove hitch*, extension was effected by the aid of pulleys nearly in the direction which the limb had acquired through the displacement of the bone. At the end of forty minutes reduction was effected without any snap or perceptible grating.

The patient, who had not vomited in the theatre, did so frequently after going to bed. He was kept very quiet, and had the hip occasionally fomented. He recovered quickly and completely, so as not to suffer the slightest pain or lameness. He paid a visit to the hospital after his dismissal, and stated that he had that day walked fifteen miles without any difficulty.

CASE VII.—*Dislocation of the Thigh Bone into the Ischiatic Notch—Reduction.*—James Inglis, aged fifty-six, while working under ground in a coal mine, and stooping forward, was struck down by a fall of earth upon his back. He was sent in from the neighbourhood of Dalkeith, where the accident happened,

on the 10th of December, the day after receiving the injury. Having repeatedly effected reduction in recent cases of dislocated hip, by the simple means of unaided manual extension, I did not think it necessary to subject this patient to any preparatory process, and at once applied the pulleys, during the operation of which he was made to take repeated doses of a strong solution of tartrate of antimony. At the end of three quarters of an hour, finding that the bone still remained displaced, I resolved to desist for the time, and make another attempt after a more careful preparation.

Next day the patient was in a very feeble state, having been extremely sick ever since returning to bed from the operating theatre. He was nevertheless put into the warm bath for an hour, and bled from the arm to the extent of twelve ounces. The process of reduction was then resumed, and in a very short time proved successful.

CASE VIII.—*Dislocation of the Thigh Bone upon the Dorsum Ilii, of six weeks standing—Reduction.*—Elizabeth Waters, aged twenty-six, fell down a coal pit near Kirkcaldy to the depth of twenty feet, and in consequence dislocated her right thigh bone. Different practitioners assured her that the joint was merely bruised, and would recover through time. At length she applied to a gentleman supposed to be peculiarly skilful in such cases, who informed her that the bone was out of its place, and could not be returned to it on account of the long time, five weeks, that had been allowed to elapse. In the course of another

week she was sent to Edinburgh, and entered the hospital on the 17th of July.

She was admitted at eleven A. M., and immediately placed in the warm bath, where I found her on making my visit at twelve. As her muscular system did not seem strong, or likely to afford much resistance, I proceeded to attempt reduction without any further preparation, except administering a dose of tartrate of antimony. The process was conducted as has been described above, and at the end of ten minutes proved successful, the bone returning into its place with a dull grating sensation. The patient suffered some pain about the joint, and was kept very quiet for a fortnight. She left the hospital on the 3d of August, with the prospect of being soon quite well.

These cases show the importance of preparatory measures for reduction, especially the warm bath; and I may add, that in all of them the extension was not maintained continuously, but completely relaxed from time to time, in order to fatigue the muscles, and disturb the patient's involuntary efforts to resist the exertions for his relief.

CASE IX.—*Dislocation of the Thigh Bone upwards and backwards, primarily on the Dorsum Ilii, secondarily into the Ischiatic Notch—Reduction.*—James Hunter, aged eighteen, was admitted on the 13th of February last, suffering from the effects of an injury caused the preceding day by a railway carriage, which threw him down with great violence. In addition to some superficial bruises, the right thigh bone was dislocated upwards and backwards. The process of



reduction was conducted as usual, and apparently with success, as the bone distinctly moved, and grated under my hand, which rested upon the trochanter, the characteristic deformity at the same time disappearing. The injured limb, instead of being almost two inches shorter, and turned inwards, so that the toes rested upon the instep of the other foot, seemed hardly at all diminished in length, and had become quite straight in its direction. But the limb, though nearly, was not quite of the proper length; the foot, though no longer inverted, did not admit of rotation outwards; the thigh had a stiff constrained aspect; and the patient's back, instead of resting flat upon the mattress, remained in an arched form, unless the thigh was raised into a position of semiflexion on the pelvis. These characters denoted dislocation of the thigh bone into the ischiatic notch, and led to a repetition of the process for reduction, which very soon had the desired effect, and the appearance of the limb became in every respect natural.

The important feature of this case is the secondary dislocation that took place during the reduction. In more than one instance which has fallen under my observation, the same change of circumstances occasioned the serious error of supposing that the bone had returned to its proper place, while it had merely shifted into the notch; and as that excellent authority, Sir A. Cooper, though he has warned against the risk of this occurrence in reducing dislocation into the foramen ovale, has not noticed it with regard to the more common case of dislocation on the ilium, or pointed out the deceitful alteration of appearances so



induced, I hope the instance here related will not be without use.

In regard to the comparative frequency of the different dislocations to which the hip joint is liable, Sir A. Cooper has stated their respective numbers in twenty cases that had fallen under his own observation,—on the dorsum ilii, twelve; into the ischiatic notch, five; into the foramen ovale, two; and on the pubis, one. It is curious, that of ten cases which have been reduced in my practice in the Royal Infirmary during the last twelve years, the proportion is almost precisely the same.

*On the Pubis.*

Alexander Grieve, aged twenty-three,—recent.

*Into the Foramen Ovale.*

Hamilton Hamill, aged forty-five,—recent.

*Into the Ischiatic Notch.*

James Inglis, aged fifty-six,—recent.

Lawrence Smith, aged eighteen,—two weeks standing.

*On the Dorsum Ilii.*

William Scott, aged thirty-six,—nine weeks standing.

Elizabeth Waters, aged twenty-six,—six weeks standing.

William Thomson, aged fifty,—recent.

James Millar, aged forty,—five weeks standing.

James Hunter,—recent.

A boy, aged fourteen,—recent

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Since the publication of this paper, many cases have occurred equally calculated to illustrate the principles which it was written to enforce as those that have been related. The advantage of effecting extension for the reduction of old dislocations of the shoulder, in a direction parallel with the long axis of the trunk, was lately well shown in the case of a man who was sent from the neighbourhood of Dunbar, about a month after suffering this injury. Reduction had been attempted at the time, and again with the assistance of pulleys, under the direction of an Edinburgh practitioner, at the end of a fortnight, but in vain. I placed a thick cushion in the axilla, and extended from the wrist while the arm lay parallel to the side, with such effect that in less than a minute the bone was replaced.

CASE X.—James Bowman, aged twenty-nine, was admitted on the 2d of May 1846, on account of a severe injury which he had sustained in superintending some workmen on the Caledonian Railway, about thirty miles from Edinburgh, from a fall of earth.

On examination, the left thigh bone was found to be fractured at the lower third, and the right one dislocated downwards into the foramen ovale. Although the diagnosis was rendered more obscure than usual by the absence of a proper standard for comparison, I did not hesitate as to the existence of displacement, and proceeded to effect reduction, which was easily accomplished. On the 16th of June, the patient was dismissed with both limbs restored to soundness.

CASE XI.—James Bee, aged sixty-five, was admitted on the 14th of September 1846, on the recommendation of Dr Hunter of Dalkeith, eight weeks after suffering dislocation of the thigh bone upwards and backwards, which had been treated as a fracture by another practitioner of that place. Reduction was attempted on the 17th without success, but was repeated on the 19th with complete effect, and the patient returned home on the 27th.

## ARTICLE XXII.

ON THE REMOVAL OF CARTILAGINOUS BODIES IN  
JOINTS.

[REPORTED FOR THE EDINBURGH MONTHLY JOURNAL OF MEDICAL  
SCIENCE, MARCH 1841 ]

ROBERT PITCAITHLY, aged thirty-seven, was admitted into the Surgical Clinical Ward of the Royal Infirmary on the 26th of January, with the view of being relieved from a moveable body in the knee joint, which had occasioned him much distress ; and repeatedly, during the course of the last two years, prevented him from following his employment as a cabinet-maker. It had been at one time on the outer side of the knee, but latterly lay alway either behind the joint, or just at the anterior edge of the *gracilis* and *sartorius* tendons. In his lecture upon this case, Mr Syme explained the danger of removing such bodies by incision, not from the entrance of air, as had been erroneously alleged by many, and more recently been maintained by M. Guerin ; but from the risk of the wound not healing by the first inten-

tion, in which case inflammation necessarily occurred, and extended to the articular textures. It was also remarked, that the patient's aspect, habit of body, and hasty manner, all led to the conclusion, that he was not a good subject for this or any other operation, so that it seemed peculiarly objectionable in his instance. On the other hand it was stated, that the palliative mode of treatment, by applying blisters to promote absorption of the dropsical effusion usually attendant upon the presence of a loose cartilage, and then bandaging to restrain its movements, had been found very ineffectual; and it was suggested that the confidence in this practice, entertained by some practitioners, might perhaps proceed from confounding partial thickenings of the synovial membrane with the presence of a loose body in the joint, an error of diagnosis frequently committed, and of which an example was mentioned in the case of a patient whose complaint had been demonstrated in the Clinical Ward to depend upon the former cause, but who nevertheless had afterwards been subjected, by another surgeon, to an operation for the removal of a cartilage, which accordingly was found not to exist.

In these circumstances, Mr Syme stated that it had occurred to him to attain the object by subcutaneous incision; that is to say, puncturing the skin merely, and opening the synovial membrane freely, so as to let the cartilage escape, and then pushing it into the cellular substance, where it might become adherent—suffer absorption—or occasion an abscess under the skin. The operation was performed on the 1st of February by means of a narrow curved bis-



toury, introduced very obliquely. The cartilage was dislodged without any difficulty, and conveyed about an inch towards the patella. A compress of lint and a bandage were then applied. The patient made no complaint until the second night after the operation (Feb. 3), when he had a slight rigor; and some swelling, with redness, appeared over the seat of the cartilage. On the 5th the inflammation had increased, and red lines extended along the skin of the thigh to the groin, where the glands were felt enlarged. During the two succeeding days the local appearances became less indicative of disturbance; but on the 8th, fluctuation being distinctly perceived over the cartilage, a free incision was made, which allowed a considerable quantity of matter to escape. On the 11th, as the discharge continued copious, the cartilage was extracted by means of a sharp hook. It was of an oval flattened form, upwards of an inch in length. The flow of matter is still rather copious, but appears to proceed entirely from the subcutaneous cellular substance, as in the common housemaid's inflammation of the knee. The joint has never been in the slightest degree swelled, red, or tender; and the patient seems in a fair way of recovery.

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This case has been reprinted as it appeared originally, in consequence of a similar proposal having, about the same time, emanated from a French provincial surgeon, M. Goyrand of Aix.

Mr Liston has attempted to improve the operation, by making a double puncture and complex incision

of the synovial membrane, in cases where unusual difficulty is experienced in displacing the cartilaginous body from the joint.\* But I should fear that there would thus accrue an increase of excitement to inflammation, the avoidance of which is the great object of my suggestion. In a case that was treated in the hospital last winter (1847), finding it impossible to effect dislodgement of the cartilage on account of its peculiar form, I applied a bandage, and enjoined perfect rest, with the effect of obtaining complete relief; so that the patient, a young woman employed as housemaid, does not now experience the slightest symptom denoting the existence of her former ailment. In the event of encountering difficulty in effecting dislodgement, instead of adopting any complicated mode of procedure, I would, therefore, rest satisfied with applying a compress and bandage to retain the body in contact with the wound which has been made in the synovial membrane, with the view of promoting union between the respective surfaces, and thus occasion a degree of fixture sufficient to prevent future trouble.

\* Dublin Journal of Medical Science, 1847, p. 35.

## ARTICLE XXIII.

## SPONTANEOUS VARICOSE ANEURISM.

[FROM THE EDINBURGH MEDICAL AND SURGICAL JOURNAL, 1831.]

VARICOSE Aneurism, or a sac containing blood, and communicating with the trunks of both an artery and vein, is a rare occurrence ; and the only instances which have hitherto been recorded either of it, or the analogous condition of aneurismal varix, where the blood passes at once from the trunk of an artery into that of a vein, originated from wounds. The femoral, popliteal, and subclavian vessels, and more frequently those at the bend of the arm, have been thus affected, in consequence of having their contiguous coats divided by some sharp-pointed weapon ; but no instance has hitherto been observed of the opening taking place spontaneously, and I therefore think it right to relate the following case of varicose aneurism, which affected the aorta and vena cava, and occurred without any external violence.

Robert Scott, aged twenty-two, in the beginning of October 1830, began to complain of pain in his back and limbs, throbbing in the epigastric region,

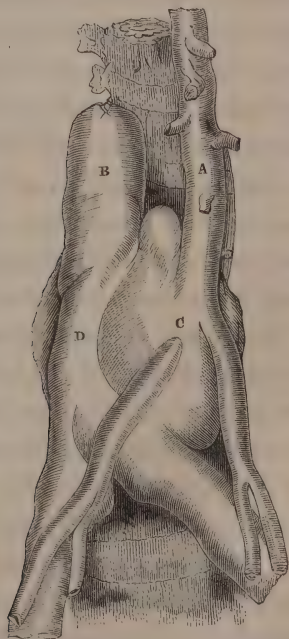
and an incessant whizzing noise, which seemed to proceed from the same part. His suffering became so severe in three or four weeks that he found it necessary to confine himself to bed, and then came under the care of Dr Robertson, who soon afterwards requested me to see him. He complained greatly of pain in his back, and coldness of his feet; but what seemed to occasion him and his friends the most concern, was the constant noise that has been already mentioned. On examining the abdomen while he lay on his back, I readily felt the pulsation of a large tumour; but it was not so strong and incompressible as that of an ordinary aneurism, and in the erect posture might have readily escaped observation.

The treatment consisted in the use of all those means which tend to moderate the force of the circulation, but proved quite unavailing. The patient's sufferings became progressively aggravated, and a new symptom made its appearance, viz. œdema of the inferior extremities and generative organs. The swelling of these parts attained a degree that I never saw equalled, and occasioned an extraordinary contrast between them and his superior extremities, which were thin and emaciated. In the latter end of January the patient died rather suddenly, immediately after complaining of a pain at his heart.

After death, the œdema, which had previously been confined to the parts below the pubis, diffused itself over the whole of the body; so that, when the dissection was commenced by the usual longitudinal incision of the integuments of the trunk, they were found to be distended fully three inches, and a copious

stream of serous fluid continued to issue from them, during nearly the whole of the subsequent examination.

In order to expose the disease completely, I removed the thoracic and abdominal viscera, and then traced the aorta from its commencement downwards. Having found an aneurismal tumour (C) seated at the bifurcation of the artery (A), which adhered intimately to the vena cava and vertebræ, I dissected out the iliac vessels, cut them across some inches beyond their division, and then sawed away the bodies of the lumbar vertebræ, together with the promontory of the sacrum.



On examining more particularly the preparation



thus detached, we observed that the tumour was of a flattened oval figure, about the size of a large orange; that it adhered to, and had caused absorption to some depth of the bodies of the three lowest lumbar vertebræ; and that it was intimately connected with the vena cava (B), which appeared much flattened, distended, and thickened. It was now suggested that there might be a communication between the aneurism and vein, and on making a small opening into the sac, so as to evacuate its contents, we found this actually to be the case. Immediately above the bifurcation of the vena cava (D) there was a round aperture somewhat larger than a sixpence, which afforded a free entrance into it from the aneurism.

The engraving represents the form and relative situation of the aneurism, and the preparation itself may be seen in my museum.

2, *Forres Street*, 18th May 1831.

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This case seems to possess some interest, in the first place, from being, so far as I know, the first instance to be found on record of a varicose aneurism being formed spontaneously; and, secondly, from affording an opportunity of ascertaining the actual condition of parts concerned, instead of studying them from imaginary plans. In the following case, I had another opportunity of examining this very rare form of disease, as existing in the living body in consequence of injury, and found a perfect resemblance between the two aneurismal sacs.

[FROM THE EDINBURGH MONTHLY JOURNAL OF MEDICAL SCIENCE, 1841.]

*Varicose Aneurism.*—Agnes Easton, aged twenty-three, was admitted on the 28th of May last, on account of an injury which she had sustained about three months before, in being bled at the bend of the arm. She stated that, the blood having spouted out with great force, and of a bright colour, a bandage was firmly applied at the time, and that, when this was removed on the following day, a small pulsating point could be felt at the seat of puncture. A penny wrapt in lint was applied here, and allowed to remain for a month, when a tumour, the size of a pigeon's egg was found to have been formed. The arm, then and afterwards, was cold and weak.

On examination, it appeared that, through the medium of the aneurism, a communication still existed between the artery and vein, the latter of these vessels being considerably distended, and conveying a jarring sensation to the hand placed over it, while the characteristic purring sound was distinctly heard, by applying the ear either directly or with the intervention of the stethoscope.

A tourniquet having been screwed on, the sac was laid open freely, so as to avoid the vein. Instead of the laminated coagulum which lines the interior of aneurisms presenting itself, it was then seen that the cavity contained only fluid blood, and that the surface of its parietes was perfectly smooth, white, and, in short, similar to that of an artery. There was hence some difficulty in detecting the wounded part of the

vessel; and I found it necessary, partly by dissection, but chiefly by tearing, to remove the principal part of the sac. The orifice being then discovered, I exposed the artery above and below it, so as to pass a ligature at each of these points. No inconvenience was experienced, pulsation being felt at the wrist the evening after the operation, and the patient was dismissed quite well on the 16th of June.

It is plain that the communication with the vein remaining open, had established a thoroughfare, if I may use the expression, through the sac, so as to prevent the stagnation requisite for allowing blood to coagulate. And it is no less evident that, in this case, ligature of the artery, without opening the cavity, could not have produced any beneficial effect.

The following case may be added as an example of the common form in which brachial aneurism used to be met with, when venesection was more frequently practised than at present.

*Brachial Aneurism.*—William Smith, aged twenty-three, was admitted on the 19th of October last, on account of a pulsating tumour at the bend of the arm, which had resulted from his being bled there nine weeks before. In consequence of the pressure that had been used to remedy the aneurism, the skin covering it was ulcerated to a small extent; the pulse at the wrist was nearly as strong as in the sound limb.

On the following day I laid open the sac, having previously applied a tourniquet, turned out the clots, and readily discovering the wound of the artery,

passed the needle first above and then below it, so as to convey a couple of ligatures, which were tightly tied. No bad symptoms followed, and the patient was dismissed on the 13th of November quite well.

This case, in addition to the others that I have on former occasions recorded, illustrates the safety and efficiency of the old operation, when applied to aneurisms resulting from injury of the humeral artery. In one instance, related ten years ago, I simply tied the artery above the swelling, but afterwards found it necessary to lay open the cavity, and place a ligature on each side of the orifice in the vessel. Since that time I have always at once resorted to the latter measure, and found it no less effectual than easy in execution.

## ARTICLE XXIV.

DISARTICULATION OF THE CLAVICLE FROM THE  
STERNUM.

IN the beginning of May last, I was asked by Dr Combe to see a gentleman in Leith, between thirty and forty years of age, who had for about two years suffered from a tumour of the clavicle. It was of an oval form, as if resulting from a general expansion of the bone, and extended from the sternal articulation to within a short distance of the acromion, possessed a very firm consistence, and was occasionally the seat of painful sensations. During the period of its existence, the patient had had occasion to travel round the world, and in his progress obtained many different opinions respecting the disease, with no less various advice as to its treatment. At the advanced stage when it came under my observation, the case seemed free from any obscurity either as to its nature or the course requisite for its remedy. There was obviously a morbid growth affecting the bone throughout its whole thickness, and admitting of removal only by excision of the clavicle.



On the 13th, I performed the operation in the presence of Dr Combe, with the assistance of Drs Duncan and Mackenzie. The patient being seated on a chair, an incision was made along the whole extent of the bone, and a second at its sternal extremity, extending upwards and downwards at right angles to it, in this form.



Having reflected the flaps, I divided the muscular attachments, and ascertained the precise limit of the disease towards the acromion, which it so nearly reached, that the easiest way of proceeding would have been to separate the bones at their junction. But thinking that the object would be equally effectually attained by division of the clavicle, with less injury to the connexions of the shoulder, I sawed the bone through, so as to leave about an inch of its extremity. The clavicle was next forcibly pulled outwards by means of strong forceps, while its remaining attachments were carefully separated towards the sternum, until nothing remained but the ligaments of the joint, which I then divided so as to complete the disarticulation. Three small vessels were tied, and the wound was dressed as usual.

Union by the first intention took place through nearly the whole extent of incision, and the patient recovered with so little disturbance, either of a local or general kind, that he was able to leave his bed-room before the end of a week. Complete cicatrization was delayed at the acromial extremity of

the wound, by the separation of small particles from the bone, apparently in consequence of the injury it had received from the saw. But this did not prevent the patient, in the course of a few weeks, from proceeding to Wales, where he intended to reside, and whence he writes that the wound is quite healed, and the arm getting strong and useful. As I fully expected that the absence of the clavicle would have occasioned considerable deformity and want of power, it was an agreeable surprise to see, that hardly any observable alteration in appearance resulted from the operation.

I am not aware that disarticulation of the clavicle from the sternum has hitherto been practised in this country, and therefore think it right to place the case just related upon record. The only part of the operation in the slightest degree difficult or embarrassing, was in separating the large articular surface of the bone from its connexions, where the vicinity of the pleura and venous trunk rendered extreme caution requisite.

## ARTICLE XXV.

## ON RESTORATION OF THE UPPER AND LOWER LIPS.

[FROM THE MONTHLY JOURNAL OF MEDICAL SCIENCE, 1847.]

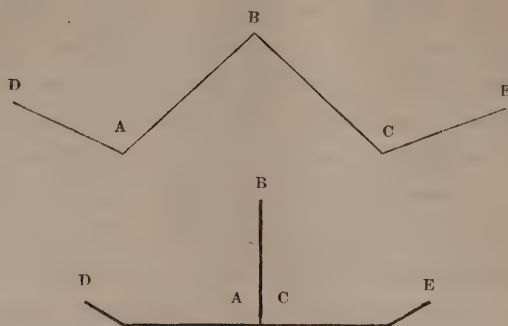
THE upper lip is very seldom affected with cancer or any other disease requiring removal; and its congenital imperfections almost always admit of remedy by proper management of the parts remaining. Restoration of the upper lip, or the formation of a new one, by employing for this purpose a different portion of the facial integuments, is therefore an operation rarely required in the practice of surgery. It is chiefly the loss of substance resulting from external violence, or abortive attempts to unite the margins of congenital fissures, that afford occasion for such a proceeding as happened in the following case.

Margaret Thomson, aged sixteen, from Arbroath, was admitted upon the 5th of December 1844, on account of a hare-lip presenting very remarkable characters. It appeared that, during her childhood, three attempts had been made, by a surgeon now no more, to unite the edges of the fissure, but unhappily without success; and that, in consequence of these

operations, the lip was almost entirely destroyed. At the left angle of the mouth, indeed, no part of it remained; and on the right side there was a mere vestige, not exceeding a quarter of an inch in extent. It may be added, that the respective surfaces were firmly condensed, and seamed with scars resulting from the old incisions and sutures. The deformity and inconvenience occasioned by this state of parts, which not only exposed to view the gums and cavity of the nostril, but seriously impeded mastication and articulation, rendered the patient very desirous of relief; and I resolved to perform the following operation with the view of affording it, though at first sight the case had certainly seemed quite hopeless.

I commenced as usual by cutting a slice of the lip freely away from each side of the fissure, including all the indurated substance, so as to expose the natural texture of the part. An incision was then made from each angle of the mouth, transversely through the cheek, slightly inclining upwards, and extending rather farther on the left than the right side. These incisions were about an inch and a quarter in length. The edges of the fissure now admitted of being brought together, without any straining or puckering of the lower lip. They were secured by a needle at their lower extremity, where forming the margin of the mouth, and by two stitches of the interrupted suture through the part above this point.

Perfect adhesion took place between the edges of the fissure, while the transverse incisions united



together from their outward extremities to the angles of the mouth, and healed throughout the remaining part, so as to form a lip in every way seemly and serviceable, the mouth having a natural appearance, neither too large nor too small, and there being no deformity of the cheek. The patient was dismissed on the 31st.

The lower lip, from its great liability to ulceration of an incurable kind, and the extensive removal of constituent substance thus rendered necessary for the patient's relief in neglected cases that have been permitted to pursue their course unchecked, is a much more frequent subject for restoration. Various operations have been proposed for accomplishing this object, and the most skilful surgeons have undertaken their performance. But, hitherto, the results of these attempts have proved so unsatisfactory, that it has generally been considered better to leave the patient unrelieved, than to try the effect of means which might probably increase his sufferings, and, at best, could not materially lessen them. The latest writer on practical surgery—Mr Liston—has



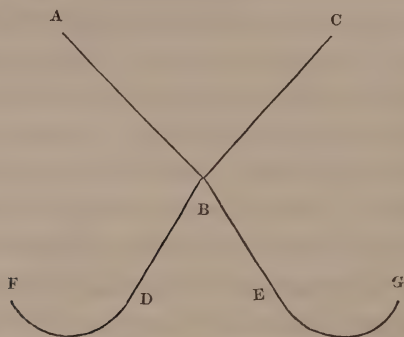
nothing better to propose than the old plan of turning up a triangular flap from below the chin, by twisting round a connecting isthmus of skin, which, however broad, does not prevent great risk of sloughing, or the certainty of œdematous swelling and protracted suppuration, with the additional discomfort that proceeds from the saliva running out, and the beard growing in.

In the cases requiring restoration of the lower lip which have hitherto fallen under my observation, I seldom attempted any remedial interference ; and the few trials made with this view afforded results nowise encouraging to their repetition. But upon a recent occasion of this kind, which rendered it peculiarly desirable to supply the defect, I carefully reconsidered the subject, and resolved to pursue a plan that seemed to promise more success than had been previously experienced. As this method completely fulfilled my expectations, and as it appears to admit of general application for the purpose in question, without any risk of failure, and with the effect of perfectly supplying the patient's defect, I beg to recommend it to the attention of the profession.

James Jenkins, aged forty-five, from Stirlingshire, was admitted into the hospital on the 14th of November last, on account of cancer of the lip. He stated that a hard swelling, with an ulcerated surface, had first made its appearance nearly seven years ago, and, after increasing gradually for twelve months, had been removed by me—that he had remained quite well for four years, but then observed a return of the former condition, which had since

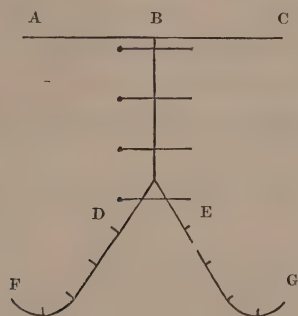
progressively extended, until he was again induced to come from the country in search of relief. Nearly the whole of the lower lip then appeared to be involved in the disease, which presented an ulcerated chasm, exposing the teeth, impeding articulation, and preventing the saliva from being retained.

On the 25th, two incisions were made from the angles of the mouth, so as to meet at the chin, and remove the whole of the morbid part in a triangular form. The lines AB and BC being supposed to



represent these incisions, I cut from the point B outwards and downwards, on each side, to D and E, in a straight direction, and then, with a slight curve outwards and upwards, to F and G. The flaps ABDF and CBEG were next detached from their subjacent connexions, and raised upwards, so that the edges AB and CD came into a horizontal line; while those represented by BD and BE met together in a vertical direction, and the lateral extensions to F and G allowed sufficient freedom to prevent any puckering or overstraining. The respective surfaces

were lastly retained in contact by the twisted and interrupted suture; four points of the former being inserted in the middle line from the lip downwards, and the same number of the latter in the curved portion on each side. The wound then presented this



appearance. It healed entirely by the first intention; and the patient, who, immediately after the operation, was able to articulate, and retain fluids in the mouth, left the hospital on the 10th of December, greatly delighted with the change effected in his condition and prospects. His features, though regular and pleasing, were not at all disfigured by the operation. The disease was entirely removed; and he could articulate as well as masticate, without inconvenience.

## ARTICLE XXVI.

## ON HYDROCELE OF THE CORD.

[FROM THE MONTHLY JOURNAL OF MEDICAL SCIENCE, 1845.]

J. D., aged twenty-four, from Denny, was admitted on the 1st of January, for enlargement of both testicles, complicated with hydrocele and ulceration of the scrotum. These complaints were attributed by the surgeon who sent him from the country to improper excitement of the generative organs, and were stated to have existed about two years. Both sides of the scrotal tumour were of nearly equal bulk, the left being solid, and dependent upon swelling of the testicle to the size of a small fist; while the right consisted of fluid to more than half of its extent. The ulceration was superficial, occupying a small space at the base of the scrotum.

On examining the hydrocele more particularly, I felt that it could be diminished by pressure, and therefore made the patient take the horizontal posture, when it became very evident that the swelling extended into the abdomen, so as to form a well-defined oval tumour, obvious to sight and touch,

ascending nearly to the umbilicus. A slight degree of pressure emptied the scrotal part of the bag, rendering that within the abdomen more tense; and when the latter was compressed, or the patient stood erect, though the abdominal tumour did not disappear, it became less distinct, while the external one became more fully distended. When the two parts of the swelling were compressed alternately, a distinct fluctuation was perceived between them.

Through the use of hydriodate of potass, and the occasional employment of a full-sized bougie, the testicles regained their natural size and consistence to a considerable degree; but no real diminution took place in the hydrocele, though the deceptive effect of changes in respect to the distension of the bowels made its size appear to vary. On the 30th I introduced a trocar, and drew off twenty-eight ounces of fluid, completely emptying both parts of the cavity. On the 10th of February, as the water had again accumulated so as, in the erect posture, to distend the scrotum nearly to its former extent, I repeated the evacuation—which now afforded only three ounces—and then injected two drachms of the tincture of iodine. The usual swelling and other symptoms of excitement followed for a few days; and, after they subsided, there was no return of the fluid.

This case derives interest, not only from the extreme rarity of the form in which the disease presented itself, but also from the light which it throws upon another morbid condition of more frequent occurrence. It is plain that the hydrocele occupied the



cord, and not the tunica vaginalis—since, in the latter situation, the fluid would have surrounded instead of lying, as it did, entirely above the testicle; and if it had had access to the cavity of the peritoneum, would not have been circumscribed within the limits of a distinct tumour. In a patient whom I saw with the late Mr George White, for ascites with double hydrocele, the fluid of the different cavities communicated through a narrow passage in the inguinal canals, and I evacuated the whole, amounting to several gallons, by tapping one of the hydroceles. The water must here have been contained in the vaginal processes, which had retained their original communication with the peritoneum. But in the case above related, the abdominal part of the swelling must have been seated in the cellular texture enveloping the spermatic vessels, and externally to the peritoneum. Now, hydrocele of the cord is frequently met with during infancy and early childhood, when it is very apt to be mistaken for rupture, in consequence of the testicle being felt lying quite free at the bottom of the tumour; and the risk of this error is greatly increased, when, as occasionally happens, the tumour diminishes or disappears upon being subjected to pressure, or when the patient is in the horizontal posture. But it is especially to guard against the erroneous diagnosis which thus results, that the present case seems to deserve attention; as it shows, that in hydrocele of the cord, accommodation for the fluid may be afforded within the abdomen, and renders it probable, that what was thus ascertained to take place on a large scale, may be of less

unfrequent occurrence to the smaller degree requisite for explaining the temporary disappearance of the swelling caused by hydrocele of the cord, through the influence of pressure or the horizontal posture.

## ARTICLE XXVII.

ON EXCISION OF THE OS UTERI, AND REMOVAL OF  
POLYPUS OF THE UTERUS.

[FROM THE LONDON AND EDINBURGH MONTHLY JOURNAL OF MEDICAL  
SCIENCE, JULY 1845.]

CASE I.—On the 8th of March, Mrs H., aged thirty-seven, recommended by Dr Combe of Leith, was admitted into the hospital on account of a growth from the os uteri. She had been married for twenty years, but never had any family. About twelve months before the time of admission, she noticed occasional hemorrhage from the womb, accompanied with pain and weakness of the back and loins, lassitude, head-ach, and giddiness. These symptoms, together with nausea and vomiting in the morning, continued to increase; and, six months later, were attended by a leucorrhœal discharge. On examination, the os uteri was found to be occupied by a large soft grayish-coloured growth, which bled when touched. It grew out in the form of a fungus, leaving a part of the cervix unchanged; and, when pressure was made at

this point, the finger did not encounter any resistance that implied induration or enlargement of the uterus.

On the 10th, having obtained a good view of the excrescence by means of a speculum, I plunged the hooked forceps deeply into its substance, and by steady traction endeavoured to bring it into view. Finding that the rigidity of the parts prevented this from being accomplished without the use of unwarrantable force, I committed the forceps to an assistant, that he might keep the ground which had been gained, and then passing the fore and middle fingers of my left hand over the growth, so as to embrace its neck between them, by successive strokes of strong curved scissors, effected the excision, with perfect smoothness and entire removal of the morbid part. The slight bleeding that followed speedily ceased, after the introduction of some dry lint into the vagina, so as to distend it moderately. The tumour was about the size of the half of a small orange, and presented all the characters of the "Cauliflower Excrescence" of the os uteri. The patient suffered nothing from the operation; and was dismissed free from complaint on the 21st.

CASE II.—Sarah Lothian, aged forty-four, from Westruther, was admitted on the 21st of March, on account of what she called a falling down of her womb. She had suffered from this complaint since last harvest, not constantly, but on occasion of any exertion, the protrusion being attended with excessive pain and occasional bleeding. The tumour, when examined, was obviously not the uterus, but a

polypous growth. It was of the size of a large egg, and originated by a narrow neck from within the anterior lip of the os tinæ.

On the 23d, I pulled the polypus down, so as to bring its attachment within view, and transfixed it close to the base with a needle and double ligature, the threads of which were tied so as to include one half in each. I then cut away the tumour, leaving merely enough of it to secure the ligature. The patient suffered nothing, either at the time or afterwards, and was dismissed on the 8th of April.

CASE III.—On the 1st of April, Dr Pagan asked me to see a widow lady about fifty years of age, the mother of several children, who had for more than six years suffered greatly from hemorrhage and other distressing symptoms, connected with a tumour of the uterus. It appeared, that during five years of this period she had been under the care of a physician who recognised the existence of a tumour, but deeming it irremediable, was satisfied with using astringent injections and other means of palliation. At length she applied to Dr Pagan, who, on examination, found the vagina filled with a soft, unorganized substance, which suggested various suspicions of organic derangement, until he satisfied himself that it was merely a deposit from the infusion of oak bark and solution of alum, which had been long employed in compliance with the instructions of the patient's former attendant. The cavity having been unloaded of this uncouth accumulation, the tumour became accessible, and seemed to admit of removal. I was



requested to examine it with this view. It was very large, of a round form, firm consistence, and smooth, though somewhat irregular surface. When traced anteriorly, it was felt to be attached a little within the os uteri—the lip of which was expanded into a sort of collar, embracing the neck of the tumour. Posteriorly, the finger could not reach its root. Having arrived at the conclusion, that the tumour was a polypus admitting of removal, we proceeded to the operation on the following day.

In the first instance, I attempted by means of the hooked forceps to draw the tumour into view, but finding that this was prevented by the orifice of the vagina refusing egress to so large a mass, I gently introduced my hand so as to dilate the passage, and then grasping the growth, while the forceps still maintained their hold, easily affected the protrusion that was desired. The neck of the swelling, which was fully an inch and a half thick, having been next transfixed from side to side, close to its root, by a needle with fixed handle, conveying a very strong double ligature, the strings were tied with all the force in my power to exert, after which the tumour was cut away without any appearance of bleeding. Not the slightest uneasiness followed. On the ninth day I made an examination, and finding that each of the ligatures contained a portion of substance which had resisted the constriction, I divided these remains of the neck by curved scissors, guided over my fore and middle fingers. Dr Pagan tells me that he has since examined the state of parts, and found every thing natural—the os uteri having con-

tracted to the natural size, and resumed its proper place ; while the patient, entirely relieved from her complaint, has daily regained strength.

Excision of the os uteri,—an operation which originated with Osiander, and was improved by Dupuytren,—experienced a cold reception in this country, on account of the incredible statements connected with reported cases of its performance. Cancer of the uterus was said to be an extremely common disease,—while it was well known to be happily a rare one ; and removal of the part affected was represented as affording permanent relief, with hardly any exception,—while the experience of attempts to extirpate malignant textures in other regions of the body, led to the expectation of a very different result. When, therefore, certain surgeons of Paris published scores of cases, in which they alleged cancer to have been cured by excision of the os uteri, it was not unnaturally concluded that their relations must, in some respect, be seriously inaccurate, and that further information was requisite before a sound judgment could be formed upon the subject.

It now appears, that cancer of the uterus is not more common than had been supposed,—that removal of the diseased part is, if possible, more hopeless than in similar affections of any other organ,—and that operations undertaken with this professed object, through ignorance or cupidity, have proved no less useless or disastrous than was to be anticipated. But it has also been ascertained that the os uteri, more

frequently than might have been suspected from the number of cases previously recorded, is liable to various morbid growths, especially that described by Dr Clarke under the title of "Cauliflower Excrescence," which, though productive of distressing or even fatal effects, are not of a malignant nature, since they exist in constitutions not otherwise unsound, and admit of complete removal by local means. So long as their treatment was limited to the employment of caustics and the ligature, no permanent benefit resulted; and it seemed as if the distinction which accurate observation had drawn between them and the cancerous degenerations, did not lead to any substantial advantage in practice. "Respecting the treatment of this disease," says Dr Clarke, "I can offer, at present, little satisfactory information. The disease being described, and distinguished from others, is something gained. All stimulating substances, either in diet or medicine, seem to aggravate it, by increasing the discharge; and no astringents, inwardly given, which I have tried, appear to lessen it."\*

A great step in advance has been made through establishment of the important fact,—for which we are chiefly indebted to the surgeons of France,—that excision of the os uteri, executed either by knives or scissors, is an operation perfectly safe and effectual, when employed for the removal of growths not possessing a malignant disposition. In performing the operation, it is always desirable, and in general easily

\* Transactions of a Society, &c., vol. iii. p. 333, 1812.

practicable, to draw the tumour fairly into view, so that the excision may be effected without taking away either more or less than what is requisite, and without injuring the neighbouring parts. The most convenient instrument for this purpose is that which Dupuytren employed—the hooked forceps of Muzeux, who invented it for facilitating the removal of enlarged tonsils. By means of the double-hooked extremities of this instrument, deeply inserted into the morbid growth towards its base, where the texture is of firmest consistence, the tumour may usually be induced, by steady traction of moderate force, to descend and present itself to view, when a bistoury or curved scissors may be used without any difficulty or danger. The assistance of a speculum should be taken to insert the forceps, and if it seems necessary, in order to obtain complete command over the excrescence, additional instruments of the same kind are to be fixed into different parts of its substance. If the tumour cannot be made to protrude without resorting to an unsafe degree of violence, it may at all events be brought down in this way, so as to be within reach of the fingers, which will then form a safe guide for the scissors, as in the case just related. The hemorrhage is seldom more than very trivial, and, when at all considerable, may be suppressed by filling the vagina with lint. In a case which happened fourteen years ago, and was, I believe, the first instance of a growth removed by excision from the os uteri in Edinburgh, I visited the patient soon after cutting off the excrescence, and, to my no small alarm, found the blood dropping from her bed

upon the floor. As there had been frequent and profuse hemorrhage from the disease, I considered it necessary to use the most efficient means for preventing any further flow, and therefore pulled the bleeding surface into view, transfixed its base with a needle conveying a double ligature, and tied both the threads firmly. Recovery was accomplished without any untoward symptom.

In removing polypus of the uterus, evulsion, excision, and ligature have been employed, and each of these modes of operation may be rendered the most eligible by peculiar circumstances of particular cases. But, in general, the combination of tying and cutting, which was practised in the cases above related, certainly seems to be the best plan of proceeding. It has the recommendation of facility, efficiency, and safety. It accurately determines the limit of destruction, prevents the possibility of hemorrhage, and relieves the patient from the fœtor, and other unpleasant consequences, which attend the slow separation effected by ligature. Finally, it has the testimony of experience in its favour. The following case, which was published in one of my *Surgical Reports*,\* affords a remarkable example of the success attending this method even under the most formidable circumstances.

I was asked by Dr Farquharson to see a poor woman, forty-eight years of age, labouring under a tumour of the uterus. The tumour was of the size of a uterus at

\* *Edinburgh Medical and Surgical Journal*, 1832.



the fifth month of pregnancy, which it very much resembled in appearance. It descended by a narrow neck from the uterus through the vagina, which, when carefully examined, seemed to be perfectly sound, and swelled out beyond the external orifice. At the fundus or lowest part there was an ulceration which threatened to slough. In other parts the tumour could be freely handled without causing pain, and felt of an equable and rather firm consistence. The patient had noticed the swelling three or four years; it grew slowly, but could always be readily pushed back into the vagina when it protruded externally, until a week or two before, when she requested Dr Farquharson's assistance; since then it had been quite irreducible, and become considerably larger.

Dr Mackintosh having concurred with Dr Farquharson and myself as to the propriety of removal, I performed the operation on the 25th of December 1831. The woman being placed in a convenient position, I transfixed the neck of the tumour with a needle, and introduced a strong double ligature, one half of which was tied above, and the other below, with all the force I could exert. When the needle was introduced, such a gush of arterial blood issued from each of the orifices, as showed the necessity of caution. There being now, however, no fear of any great hemorrhage, the neck of the tumour was cut through with a bistoury a little below where it had been tied. A small jet of blood towards the centre of the cut surface showed that the constriction did not operate there with sufficient force. The part whence it proceeded was therefore transfixed with a

pin, round which a thread being tied, the bleeding was completely checked. The patient made no complaint during or subsequent to the operation ; she felt quite well in a few days, and has continued so ever since. On examination, no trace of the tumour can be perceived. When divided, the morbid growth displayed the characters of simple vascular sarcoma.

## ARTICLE XXVIII.

## ON POLYPUS OF THE RECTUM.

[FROM THE LONDON AND EDINBURGH MEDICAL JOURNAL, 1845.]

SIR A. Cooper states in his *Surgical Lectures*, that, “in the course of his life,” he met with only ten cases of polypus of the rectum. Some time ago I met with five cases in the course of a single fortnight—two of them in adults, and three in children—and I have seen a sufficient number of other instances of the disease, to satisfy me that it is not by any means so rare as has generally been supposed. It presents itself in three very different forms, of which one usually occurs in childhood, and does not appear much beyond puberty. A gentleman now established in practice not far from Edinburgh, when attending my lectures—then I suppose about eighteen or nineteen years of age—applied to me for the removal of a polypus, such as is met with in early life, but, with this exception, I never met with it beyond the ninth or tenth year. It is extremely soft and vascular, of a florid red colour, and assumes the form either of a worm from two or four

inches in length, or of a strawberry with a connecting foot-stalk two or three inches long. This tumour seldom protrudes except when the bowels are evacuated, and then admits of ready replacement, though not without occasional hemorrhage, which may be of considerable amount. The vascularity of this growth, and its attachment above the sphincter, made me averse from removing it by excision; and Sir A. Cooper has mentioned the alarm that was on one occasion excited in his practice by doing so. I have always employed the ligature; and though the soft texture readily gives way when the thread is drawn, bleeding has never occurred in a single instance, or any other symptom in the least degree disagreeable resulted from this mode of removal; I am therefore induced to regard it as the best that can be employed.

The disease appears in adults in two very distinct forms. In one of these, the growth is soft, vascular, prone to bleed, lobulated or shreddy, and malignant-looking, so as on the whole to resemble very much the cauliflower excrescence of the os uteri; but possesses a peduncle or foot-stalk of firm texture, capable of sound cicatrization after being divided. The profuse, frequent, and protracted bleeding which proceeds from this sort of growth, renders its removal an object of great consequence; and this may be effected very easily, with perfect safety, by transfixing the radical cord of connexion with a double ligature, tying the threads so as to include a half of it in each, and then cutting it across a little below the constricted part. In a patient of Mr Craig of Ratho

(who detected the disease from the great hemorrhage it occasioned), I could not accomplish protrusion of the tumour, but guided a ligature on my finger, and tied it on the neck within the rectum. It is more satisfactory to force or draw the swelling beyond the sphincter, so that the sound and morbid parts may be distinguished with certainty; and this can usually be done with great facility, although the growth has attained a large size. In an hospital case recommended by Mr Anderson of Castle Douglas, I brought into view and removed a tumour not less than an orange, which had a most malignant aspect, and had nearly exhausted the patient by hemorrhage.

In the other form which polypus of the rectum assumes in adults, the tumour is of a firmer consistence, smoother surface, and more regularly spherical or oval form, so as to resemble the growth which in general constitutes *polypus uteri*. The symptoms resulting from this simple swelling are rather annoying than seriously alarming; and the patient, therefore, is apt to delay requiring assistance for a long while. In the case of an old lady, whom I saw with Mr Hilson of Jedburgh, the tumour was about the size of a cherry, with a long stalk, and we were assured had protruded every time the bowels moved for twenty years. In another case, a gentleman whom I saw with Dr Johnston of Cumnock, the tumour was nearly as large as an egg, had a cuticular covering, and appeared to have existed for a period equally long. I have always removed these growths in the way that has been already described, and never met with the slightest consequence of a disagreeable kind.



## ARTICLE XXIX.

ON THE CONTRACTILE OR IRRITABLE STRICTURE OF  
THE URETHRA.

ALTHOUGH the distinction between spasmodic and organic strictures, or, in other words, between the semblance and reality of contraction, has been long established in Surgical Pathology, the latter of these conditions was not supposed to vary except in degree and situation. The treatment, therefore, did not seem to require any diversity of procedure, and in this country most practitioners, preferring the plan of dilatation by bougies, employed them upon all occasions. But, however efficiently strictures of the urethra might in general be thus treated, no surgeon could employ the practice to any considerable extent, without encountering embarrassing cases that presented more than usual difficulty, or even baffled every effort to accomplish recovery. I do not here allude so much to the mere tightness of contraction, and difficulty consequently experienced in passing a small instrument through the stricture, as to the unyielding disposition manifested by the constricted canal,

and its tendency to contract, perhaps even more closely than before, after being partially or completely dilated. One other feature of such obstinate cases of great importance to notice is, the strong and general sympathy of the system with every change taking place in the local disease; whence rigors and febrile attacks, leading to various derangements in different parts of the body more or less intimately connected with the part originally affected, are apt to result from attempts even of the most gentle kind to pass instruments into the bladder. Some constitutional disturbance, as that which occasions arthritic symptoms, would sometimes appear to be the cause of this particular state of stricture; and a local irritation, such as that of urinary concretions, is certainly adequate to produce the same effect, since all the features of excessive obstinacy and irritability are occasionally presented by stricture, in patients suffering from stone, and disappear at once so soon as it is removed. But, independently of either the one or the other of these influences, the peculiar condition of stricture to which I wish to direct attention, may exist in its most perfect form, and is then found to constitute one of the most vexatious subjects of treatment so long as it is combated by the means in ordinary use. The patient, in vain expectation of relief, is apt to require in succession the assistance of many different practitioners, each of whom, supposing that the previous want of success has depended upon deficiency of skill or care, proceeds to a repetition of the dilating process, destined to afford only a similar disappointment, or the more serious

consequences already mentioned as not unusual under such circumstances. The following case presents a good illustration of this obstinate stricture. It led me to adopt the mode of treatment which I am now desirous of recommending, and will probably prove more impressive if allowed to stand alone, than if associated with other instances of the operation. I have repeatedly performed it with perfect success, and never with any unpleasant consequences; so that instead of dreading, as formerly, to meet with the form of stricture in question, I now undertake its charge with the confidence of a satisfactory issue; and, while doing so, reflect with much regret upon the suffering that it would have been in my power to relieve, if this plan of treatment had occurred to me at an earlier period.

About six years ago, I was requested by the late Dr Hay to take charge of a gentleman who had suffered long and severely from stricture of the urethra. He was between forty and fifty years of age, of tall stature and robust form. His complaint had existed twenty years, and during the earlier part of this period been partially alleviated by the introduction of bougies, but had then gradually increased, until at length the suffering occasioned by it was altogether intolerable. During both day and night, the calls to make water were extremely frequent, and excited the most violent expulsive efforts, which, aided by a milking-like manipulation of the penis, and pressure along the perineum, never produced any thing more than a scanty dribbling discharge. From the bladder being

thus imperfectly emptied, the urine was constantly passing away insensibly, so as to keep the clothes wet, with what discomfort to the patient may be more easily imagined than described. He was peculiarly susceptible in regard to atmospheric changes, and especially in damp weather suffered an aggravation of the symptoms. The urine, when collected on such occasions, was found to deposit large quantities of glairy mucus, from which indeed it was never quite free.

On examination, I found a tight stricture between five and six inches from the orifice of the urethra ; and at the second or third attempt, succeeded in passing the smallest-sized bougie fairly through it into the bladder. I then supposed, that as usual there would not be any further difficulty in treating the case, and desired the patient to call upon me twice a-week, unless when the weather or any other circumstance should render a longer delay necessary. The progress, though not rapid, at length enabled me to pass No. 5 of my scale, equal to No. 1 of that in common use, when I found it impossible to make any advance. Indeed there was little encouragement to persevere in attempting this, as, notwithstanding the degree of dilatation that had been accomplished, there was not any appearance of relief from the symptoms of the disease.

I then proposed to confine the patient to bed, and keep a succession of catheters, gradually increased in size, in the bladder. He made no objection, and was greatly pleased to find, that instead of the irritation he expected, there was at once obtained complete

relief from all his previous uneasy feelings. He read and wrote, ate and slept, without the least disturbance, drawing off the urine from time to time, and observing to his great satisfaction that the mucus had entirely disappeared. At the end of ten days I withdrew the full-sized silver catheter then employed, and before twenty-four hours had expired, found the complaint in every respect exactly as it had been before the process was commenced.

Some months after this, I divided the stricture from within by means of a catheter containing a lancet blade, which was protruded from its sheath after the instrument had been passed through the seat of contraction, and kept in this expanded state while the catheter was withdrawn. A large bougie was immediately afterwards passed with perfect ease; and again hopes of success were entertained. But next day things were in precisely the same state as formerly.

Several months having elapsed without any change, it was resolved to combine the two last-mentioned modes of treatment. In the first place, I divided the stricture as before, but on both sides, by means of two lancet catheters, cutting right and left, and then introduced a full-sized catheter into the bladder, where it was retained for a week. For some time afterwards it seemed as if benefit had resulted from this procedure, and the patient, by frequently passing a bougie or catheter through the strictured part, was enabled to make water in a tolerably full stream. But this imperfect relief was of short duration, and by the end of two or three weeks, the frequent calls,



laborious straining, and copious mucus, proclaimed that the stricture had regained its former condition.

The patient now protesting that life was not desirable under the torment of his complaint, and entreating me to employ some efficient measure of remedy, no matter at what expense of pain or risk of danger, I resolved to divide the stricture by free external incision. With this view, a small staff, grooved on its convex side, having been introduced, I made an incision in the raphe of the perineum from the bulb to the anus, and then feeling for the stricture, which was easily recognised by its surrounding induration—ran the knife fairly through the whole extent of thickened texture. A full-sized catheter was substituted for the staff, and retained for a few days. The patient suffered little from the operation, but some uneasiness from irritation caused by the urine passing through the wound. When it closed he felt quite well; and he continues to do so, though several years have now elapsed. He has never required the bougie, and in every respect enjoys the most perfect health.

In this case, the obstinacy of resistance, and tendency to contract, occurred in an extreme degree. Indeed, the latter peculiarity was so strongly marked, that it suggested the idea of an adventitious elastic texture, or rather one possessing contractile properties similar to those of the middle coat of the arteries. It is plain that the most prolonged use of bougies would not have effected a cure. And the result of retaining catheters in the urethra, shows that this mode of treatment is not so effectual as it has been represented, since it only produced a temporary dila-

tation. But the most important lesson is to be drawn from the results of the different trials that were made of internal incision by lancet catheters. Additional space was thus at once obtained, and the passing of bougies was greatly facilitated, without any lasting difference being effected in the contractile power of the stricture. It hence appears that this mode of treatment affords no practical advantage, since, in the ordinary condition of stricture, bougies accomplish recovery on the easiest possible terms; and in its obstinate form, an internal incision does not prove sufficient to relieve the patient. The reason of this, I believe to be, that the obstinate stricture in question requires, for its complete and permanent remedy, a thorough division of the firm texture which surrounds the contracted part of the canal.

It may be said that there is nothing new in the treatment here proposed, and that it has long been the established practice to cut through strictures of the urethra by external incision. But the operation thus performed had for its object the restoration of a canal, either obliterated or so obstructed as to prevent the introduction of instruments; while I propose to employ it for the remedy of permeable contractions not amenable to the ordinary process of dilatation. I may remark, in conclusion, that strictures are divided with the latter view much more easily and safely than when the other object has to be attained, since the guidance of a grooved conductor, which may always be had, completely obviates any risk of failure, and ensures the incision being properly placed.

## ARTICLE XXX.

## ON LITHOTOMY.

[FROM THE EDINBURGH JOURNAL OF MEDICAL SCIENCE, AUGUST 1844.]

IN operating upon children, the only instruments required for executing the incisions are a grooved staff, with the common straight bistoury blunted to an inch and quarter from the point ; and all the experience I have had leads me to the persuasion, that before the period of puberty any additional apparatus would be useless and inconvenient. But in adults, where the prostate gland has become developed, along with the other organs concerned in generation, the state of parts being materially different, a corresponding alteration in the mode of procedure is requisite for its safe and effectual performance. The necessity of this rests upon the importance of dividing the gland to a certain extent, and upon the deep situation of the parts concerned, which prevents the incision from being precisely regulated by sight or touch.

It would not be correct to say that the incision of the prostate is the most important step of the

operation, since imperfection in any part of the process prevents it from leading to a good result. If the external incision be too small or not well placed—if the muscles of the perineum be not fully divided,—and if the stone be not properly extracted, the most perfect incision of the prostate will not protect the patient from danger. But if not the most important, this certainly is the most critical step, since, while the others admit of being modified and corrected, it is determined in the moment of execution. If it be too free, it cannot be contracted; and if too limited, it cannot be extended without endangering the neighbouring parts. It hence becomes of great consequence to determine the proper extent of incision, and also to ascertain the means of effecting it with most precision.

Notwithstanding the diversity of opinion at present existing on the subject, and the conflicting statements of experienced writers, I am persuaded that all successful operators have made their deep incision nearly to the same extent, and that the apparent discrepancy between their directions proceeds merely from the careless use of language, or the erroneous impressions under which they wrote. I have been led to this conclusion, in the first place, by ascertaining that there is a part at the neck of the bladder which *must* be divided, in order to allow the extraction of even a small stone, without inducing fatal inflammation of the bladder; and that, if this part be divided, additional space is readily obtained through dilatation by the finger, the remaining part of the prostate tearing in the direction it is cut,—the

mucous membrane of the bladder stretching,—and the fibres of its muscular coat separating from each other; and secondly, by finding that the various forms and modes of incision which have been recommended on the ground of success, when carefully considered and compared with their contexts, are calculated to produce this effect. The part I mean is that which is usually called “the neck of the bladder,” which opposes the final resistance to passing a catheter, which gives the feeling of a ring when the finger is introduced through it, and which seems to be the most sensitive portion of the urinary apparatus. When catheters or bougies reach this point, sickness and fainting frequently betray its peculiar sensibility of irritation; and when the stone presses upon it, the patient suffers an agony that characterises his complaint. I believe that leaving this ring entire is the most dangerous error which can be committed in performing lithotomy. It results either from the influence of such statements as, “the less that is cut, the greater will be the patient’s safety,”—or from inability of regulating the instrument employed, so as to cut the extent desired.

In operating with a curved staff, it is very difficult to know how far the knife cuts when it runs along the groove. The perineums of different people vary so much in the proportional size and relative distance of their component parts; and the instrument is so apt to have its direction changed by movements of the patient, or of the assistant’s hand which holds the staff, that the incision cannot be regulated as in other operations, where it is guided by sight or touch.



Mr Cross of Norwich has declared \* his conviction, from what he personally witnessed, that Mr Martineau did not cut nearly to the extent he has described. But if a surgeon so experienced cut less than he intended, and supposed,—is it not possible that others may have unconsciously exceeded the bounds prescribed by them? At all events it must be admitted, that, except in the hands of those who acquire the trick or knack of operating with them, a straight knife and curved staff are very uncertain means of executing the prostatic incision.

In a former number of this Journal I advised the use of a straight staff, introduced through the wound of the perineum, as a guide in cutting the prostate, and I have now to propose a knife which promises to obviate all risk of error in making the incision through this part. It was suggested to me by the case of a respectable citizen here, on whom I had occasion to operate. He was corpulent to an extreme degree, and possessed a perineum of extraordinary depth, as well as brawny firmness. The stone was removed with success, but I did not feel satisfied with the operation, from finding that in such circumstances the means employed were not adequate to effect division of the prostate with facility and accuracy. With the view of rendering the process more certain, I carefully reconsidered the subject, and made many trials upon the dead body, with the result of contriving an instrument for the purpose. It is a triangular-shaped knife, straight and blunt on

\* Treatise on Urinary Calculus, p. 156.

the back, for running in the groove, and sharp on its convex edge from the point half-way backwards to the extremity,—the remaining part being blunt but thin. If this *prostatome* be pushed along the groove of the straight staff until the blunt part is arrested by the prostate, it will sufficiently divide the neck of the bladder,—and if the operator forces it further onwards, or even into the cavity of the bladder, no harm can result, from the blunt part of the edge merely anticipating the dilatation which must otherwise be effected by the finger.

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For some time past I have been satisfied that the *blunt* part of the knife is of no use, and, therefore, had it ground off.

The opinion which I have expressed,—as to the practice of lithotomists, in cutting the prostate, being less varied with regard to extent of incision than might be supposed from their respective statements,—has received a remarkable confirmation in one instance, which I feel much pleasure in noticing. In teaching the necessity of cutting fairly into the bladder, I have been considered as diametrically opposed to Mr Liston, whose position in the profession, and long connexion with Edinburgh, give his authority much weight in this school. In his *Operative Surgery*, 1840, he has said, “ But the internal incision must be very limited indeed; it should certainly not extend beyond six or seven lines from the urethra outwards and downwards, as marked on the sketch; for the less that is cut, the greater will be the patient’s

safety." And the accompanying sketch represents a mere notch in the apex of the gland. But in the last edition of his Practical Surgery, 1846, he has introduced a sketch "to show what it is indispensable to cut. If that is effected, the dilatation can be carried to any required extent. The two white triangular spaces at the base of the gland in front and behind, show a texture of the dense, unyielding, fibrous tissues, into which the muscular fibres are inserted; this band effectually prevents dilatation or enlargement of the orifice of the bladder, beyond a certain and very limited extent, without laceration, dreadful suffering, and imminent danger. The incision required to divide this, need not pass very far from the groove of the staff."\* I have always felt assured, that an operator so successful as Mr Liston must cut to this extent, and also that he intended to advise its being done, although the language he employed had led to a different conclusion.

\* Page 510.

## ARTICLE XXX.

CASE OF RECOVERY AFTER RUPTURE OF THE URINARY  
BLADDER BY EXTERNAL VIOLENCE.

ON the evening of the 5th of July, I was requested, by Messrs Joseph and Benjamin Bell, to see with them a young gentleman who seemed to have had his bladder ruptured. Circumstances prevented me from meeting these gentlemen until midnight, when I learned from them that the patient, a stout youth, seventeen years of age, after dining with his family, had gone out to take a walk, in the course of which he had encountered a low paling, about two feet high, and attempted carelessly to leap over it, but, instead of doing so, had fallen forwards, so as to strike the lower part of his belly with great force on the points of two upright spars of wood. He immediately complained of intense pain, and of a feeling as if his bowels had protruded; his brother, who had accompanied him, at the same time remarking that his clothes were distended over the belly. With the aid of support on each side, he then accomplished a few steps, so as to reach a carriage that had been brought as near as possible to the place where he was lying. A catheter had been intro-

duced, and, after drawing off four ounces of bloody urine, allowed to remain in the bladder. We found all the usual signs of ruptured bladder; there being great pain and distension of the belly, with a sunk, anxious look. Twenty leeches and hot fomentations were applied. The catheter was taken out, and an opiate prescribed.

On the following day the abdominal pains and swelling were increased, there being dulness on percussion below the umbilicus, and more than ordinary resonance above it. The catheter was introduced with the effect of withdrawing a few ounces of bloody urine. In the evening, leeches were again applied, and an opiate prescribed.

Next day, the 6th, he was found to have passed a restless night. There was some confusion of ideas, and considerable impatience for a change of posture, &c. The abdominal swelling had increased, and there was some œdema of the posterior parts from the chest down to the thighs. The catheter was introduced twice, and each time drew off a quantity of bloody urine, similar to that which had been obtained on the former occasion.

On the 8th he was in much the same state, and not sinking, as we had had fully expected to find him; but the whole trunk was fearfully swollen, and his respiration was performed as if only a small portion of the lungs had room to act. The œdematous effusion had greatly increased at the lateral and lower parts, while the tympanitic condition was still more manifest anteriorly and superiorly. Below the umbilicus there was not only complete dulness on



percussion, but obscure fluctuation, which, after careful deliberation, induced us to think that an incision in the linea alba, a little way above the pubis, might be of use. After cutting through a thick mass of condensed texture at this part, I saw a stream of clear fluid begin to trickle out, and, wishing to see the effect of what had been done before proceeding further, we ordered a large soft sponge squeezed out of warm water to be applied so long as the fluid should continue to escape. In the evening it was ascertained that a very large quantity of urine had passed from the wound, and the abdominal swelling was considerably reduced, while in all other respects the patient appeared to have experienced relief. The catheter had been introduced twice during the day without obtaining a drop of water, although nearly a tumblerful was taken off by it in the morning before the incision.

On the 9th the pulse had fallen to 100. The abdomen was greatly collapsed, and every thing seemed favourable, and he continued in this satisfactory state until the following evening, when it was observed that the urine ceased to come freely away, and he became restless, with a return in some degree of his former unpleasant symptoms.

On the 11th there was considerable swelling of the lower part of the belly, with quick pulse and foul tongue. The wound looked dry and white, as in a patient after lithotomy who is suffering from inflammation at the neck of the bladder. We entertained serious apprehensions of the sequel, but thought it right to enlarge the aperture lest there should be any obstruction to the flow of urine. I effected this by

means of a bistoury, so freely, that my finger could be introduced down to the muscles, which were found separated from each other in the mesial plane to the extent of an inch and half, so as to form a narrow slit through which the water passed.

On the 12th the belly was collapsed. The pulse had fallen to 80, and the patient was quite easy.

No particular change occurred until the 19th, when a considerable quantity of sloughy cellular substance was extracted from the wound; and on the 21st, in consequence of there being a rather copious discharge of matter from the cavity lying between the integuments and muscles of the abdomen, a free counter opening was made on each side, as low in the flank as the point of a catheter could be pushed. A great improvement speedily followed the establishment of these drains so far as the superficial parts were concerned, although there was still a copious issue of thick matter from the aperture between the muscles.

On the 26th, seeing a slough at the orifice, I seized it with dressing forceps, and gradually pulled out a bag bearing no small resemblance to the bladder, which was found to consist of dead cellular substance, lined with a white deposit from the urine. I then passed my finger down into the bladder and felt a rent more than an inch long in the anterior part of the fundus without, or on the pubal side of the reflection of the peritoneum.

On the 5th of August the patient very unexpectedly passed seven ounces of water by the urethra, though the catheter had been frequently introduced before without obtaining so much as a tea-spoonful,

ever since the opening above the pubis was made. In the course of a fortnight the patient was in every respect perfectly well, and quickly regained his strength without the slightest trace of inconvenience from the injury.

As there is not upon record, so far as I know, any well authenticated instance of recovery from rupture of the urinary bladder by violence, this case may be regarded as of some interest, and also, perhaps, prove of practical use on such occasions, by suggesting the possibility of affording relief through local treatment. Mr Benjamin Bell informs me, that while he was a resident pupil in Bartholomew's hospital, it was found, on examining the body of a child, that in addition to other injuries of a mortal kind caused by the wheel of a carriage, the bladder was ruptured precisely in the same situation as in the patient whose case has just been related. If the rupture takes place above or within the reflection of the peritoneum, there cannot be the slightest chance of escape. But if the rent is at the anterior part, so as to discharge the contents of the bladder by a sudden gush into the cellular substance, and condense it in such a way that merely the portion in contact with the urine is deprived of life, it appears that the patient may be saved by timely incisions.

FINIS.

ERRATUM.

PAGE 113, line 16, *for* new malignant, *read* non-malignant.







